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GOVERNMENT REPORTS

ANNOUNCEMENTS & INDEX

November 12, 1976

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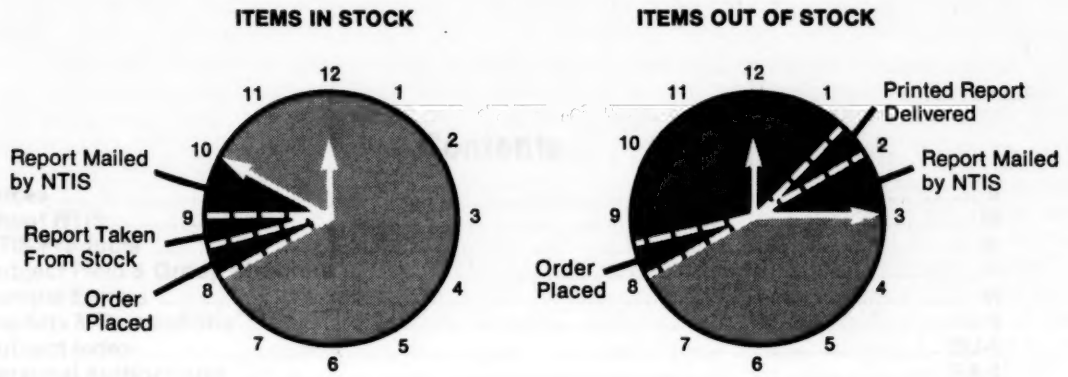

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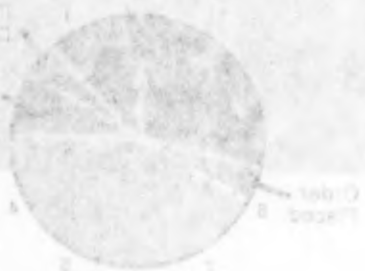

GOVERNMENT REPORTS ANNOUNCEMENTS & INDEX

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(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft, Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology, Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings; Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection, Communications, Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Nonpower); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory; Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

Sample Entries

Report entries are arranged by COSATI group and field. Within fields they are arranged alphanumerically by Accession (Order) Number - alphabetic data precedes numeric.

AD/A-003 266/4GA PC$6.25/MF$2.25
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Final rept. 16 Sep 67-15 Sep 73,
F.T. Ulaby, and R.K. Moore, Jun 74, 172p Rept no. CRES-TR-133-29 ETL-CR-74-10
Contract DAAK02-68-C-0089
See also AD-743 234.

Descriptors: *Radar mapping, *Target discrimination, Aerial reconnaissance, Data processing equipment, Preprocessing, Microwaves, Ultrasonic radiation, Image intensification, Backscattering, Agriculture, Vegetation, Land use, Soils, Scattering, Spectrometry.
Identifiers: Themis project, *Remote sensing.

This report summarizes the technical work accomplished under Project THEMIS, A Center for Remote Sensing at the University of Kansas during the period 16 September 1967 through 15 September 1973. The highlights of the four major areas forming the remote sensing system are presented. A detailed description of the latest radar spectrometer results is presented.

Index entries are arranged alphanumerically. Titles are included in all indexes except Contract Number Index. Sample entries for each index follow:

Subject: Entries are sequenced by major subject term, second paired term, and accession number.

RADAR MAPPING
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Personal Author: Entries are sequenced by personal author, report title, and accession number.

MOORE, R. K.
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Corporate Author: Entries are sequenced by corporate author name, report number, and accession number. The monitor agency number is given following the report title.

KANSAS UNIV/CENTER FOR RESEARCH INC LAWRENCE REMOTE SENSING LAB
CRES-TR-133-29
Project THEMIS: A Center for Remote Sensing.
(ETL-CR-74-10)
AD/A-003 266/4GI

Contract Grant Number: Entries are sequenced by contract or grant number, corporate author, and accession number.

DAAK02-68-C-0089
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
AD/A-003 266/4GI

Accession/Report Number: Entries are sequenced by accession, report, or monitor agency number. Prices are given in this index.

AD/A-003 266/4GI
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI 8F PC$6.25/MF$2.25

REPORTS ANNOUNCEMENTS

1. AERONAUTICS

1A. Aerodynamics

AD-A029 662/4GA PC$5.50/MF$3.00
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
An Experimental Investigation of the Effects of Planform and Thickness Discontinuities on the Aerodynamic Characteristics of a Family of Low Aspect Ratio Wings.
Master's thesis,
Roger D. Hartman. Sep 76, 124p Rept no. GAE/AE/76S-1

Descriptors: *Wings, *Planform, Thickness, *Aerodynamic characteristics, Coefficients, Aspect ratio, Aerodynamics, Wind tunnel tests, Reynolds number, Lift to drag ratio, Vortices, Lift, Experimental data, Experimental design, Theses.
Identifiers: Low aspect ratio.

An experimental investigation to determine the aerodynamic coefficients of a family of symmetric wing planforms with abrupt planform and thickness discontinuities was conducted. The wing consists of a rectangular center panel with two small, tapered outboard panels. Six different pairs of outboard panels attached to the center panel at different locations were tested. Wind tunnel tests were conducted at Reynolds numbers between 1,740,000 and 1,990,000 and Mach numbers of approximately 0.13. Aspect ratios were between 0.875 and 2.29 The lift curve slopes increase at high angles of attack for small and intermediate outboard panel configurations, suggesting vortex lift due to the low aspect ratio center panel. Drag polars are parabolic except over ranges of angle of attack where outboard panel stall overrides center panel vortex lift. The pitching moment about the center panel quarter chord is near zero for outboard panels mounted at the position, becoming nose down as the outboard panels move aft. Fore and aft shifting of the outboard panels had little effect on C(l), C(d), and lift-to-drag ratio. A vortex lattice analysis consistently predicted C(l) and C(m) well, but predicted induced drag poorly. (Author)

1B. Aeronautics

AD-A029 431/4GA PC$3.50/MF$3.00
Federal Aviation Administration Washington D C Office of Aviation Medicine
Accident Experience of Civilian Pilots with Static Physical Defects.
J. Robert Dille, and Charles F. Booze. Jun 76, 12p Rept no. FAA-AM-76-7

Descriptors: *Aviation accidents, *Handicapped persons, Physical fitness, Civil aviation, *Pilots, Aviation safety, Visual perception, Blindness, Color vision, Performance(Human).

The U.S. Federal Aviation Administration (FAA) is committed to establishment of airman physical standards and certification policies that are as liberal as possible without compromising aviation safety. Through the years, medical flight test results, research, and consultant opinions have resulted in relaxation of medical standards and policies and current FAA certification of 4,704 pilots with blindness or absence of one eye, 14,421 who wear contact lenses, 15,779 with deficient color vision, 15,543 with deficient distant vision and smaller, but significant, numbers with paraplegia, deafness, and amputations. Limitations are placed on flying activities when appropriate. Routine aircraft accident investigations seek to determine the presence of physical problems in the involved airmen and any probable association of the defect with the accident cause. Three categories exceeded expectations significantly: blindness or absence of one eye, deficient color vision with a waiver, and deficient distant vision. However, these groups reported much higher median flight times than a non-accident airman population and accident airmen without any of the pathology selected for this study. Analyses of available data proved inconclusive but increased exposure may account for most or all of the increased accidents observed for airmen with these three pathologies.

1C. Aircraft

AD-A029 162/5GA PC$6.75/MF$3.00
Federal Aviation Administration Washington D C Systems Research and Development Service
A Crashworthiness Analysis with Emphasis on the Fire Hazard: U.S. and Selected Foreign Turbine Aircraft Accidents, 1964-1974.
Final rept.,
Thomas G. Horeff. Jul 76, 167p Rept no. FAA-RD-75-156

Descriptors: *Aviation accidents, *Aircraft fires, *Jet transport planes, *Passenger aircraft, *Commercial aircraft, *Aviation safety, Firefighting vehicles, Survival(General), Airports, Tables(Data), Death, Bibliographies, Fuel tanks, Jet engine fuels, Explosions, Inert materials, Fire prevention, Aviation injuries, Fire protection, Fire suppression, Rescues, Evacuation, Impact, Escape systems.
Identifiers: *Crashworthiness.

An analysis of 382 impact-survivable/substantial damage turbine aircraft accidents and incidents which occurred during the 11-year period from 1964 through 1974 was performed as part of an overall study of the interrelationship of aircraft crashworthiness and airport crash fire-rescue services. The analysis included 343 accidents and incidents which occurred in the U.S. and 39 outside the U.S. Crashworthiness data were obtained from accidents both in and outside the U.S. The U. S. accidents also provided data for an airport crash fire-rescue service analysis. The crashworthiness analysis indicated that 94.9 percent of the fatalities in world-wide U.S. air carrier impact-survivable accidents resulted from accidents where fire occurred. Fire and its effects were estimated to be the cause of: (1) forty percent of the fatalities; (2) fatal injuries to 23.3 percent of the occupants in survivable/fatal accidents; and (3) a reduction in survivability, from 65.2 percent to 41.9 percent, of the occupants in survivable/fatal accidents. The status of FAA crashworthiness R and D programs directed toward the development of aircraft fire protective measures is described to focus on efforts being taken to reduce the fire hazard. (Author)

AD-A029 164/1GA PC$6.75/MF$3.00
Lockheed Missiles and Space Co Inc Huntsville Ala Huntsville Research and Engineering Center
Wake Vortex and Groundwind Meteorological Measurements.
Final rept. 28 Aug 74-5 Sep 75,
M. R. Brashears, K. R. Shrider, D. A. Love , S. J. Robertson, and A. D. Zalay. May 76, 168p LMSC-HREC-TR-D496558, FAA-RD-76-93, , TSC-FAA-76-14
Contract DOT-TSC-904

Descriptors: *Wake, *Vortices, *Trailing vortices, Wind, Transport properties, Decay, Ground effect, Meteorological data, Ground level, Measurement, Mathematical models, Wind shear, Turbulence, Hazards, Meteorological instruments, Detectors, Computer programs, Computerized simulation.
Identifiers: Groundwind, Aircraft wakes.

Wake vortex groundwind and meteorological measurements obtained by DOT-TSC at John F. Kennedy (JFK) International Airport have been reduced, analyzed, and correlated with a theoretical vortex transport model. The predictive Wake Vortex Transport Model has been updated so that detailed on-site meteorological measurements can be interpreted and utilized to predict more accurately the vortex transport and decay characteristics. A discussion of the wake vortex test data analysis and software development is presented, including a description of the JFK wake vortex test program, the computer processing of wake vortex measurements, the analysis of groundwind sensor measurements, and the analysis of meteorological measurements. (Author)

AD-A029 168/2GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
Application of Circulation Control Rotor Technology to a Stopped Rotor Aircraft Design.
Research and development rept.,
Robert M. Williams. Dec 75, 32p Rept nos. Aero-1218, DTNSRDC-4574
Presented at the European Rotorcraft and Powered Lift Aircraft Forum (1st), 22-24 Sep 75, Southhampton Univ. (England).

Descriptors: *Rotary wing aircraft, *Vertical takeoff aircraft, *Short takeoff aircraft, *Performance(Engineering), *Rotary wings, Circulation, Control, Airspeed, Range(Distance), Payload, Aerodynamics, Weight reduction, Turbofan engines, Shafts(Machine elements), Helicopter rotors.
Identifiers: *Stopped rotor aircraft, Circulation control rotor technology, Dual shaft engines, Dual spool turbofan engines.

This paper presents the application of circulation control rotor (CCR) technology to a revolutionary new aircraft concept--the X-Wing stopped rotor V/Stol. This design affords the potential for major advances in rotary wing aircraft speed, range-payload, productivity, and cost through the application of highly innovative aerodynamic and structural design. The technology base for the concept has been derived from almost 6 years of related CCR aerodynamic and structural design studies at the David W. Taylor Naval Ship Research and Development Center (DTNSRDC) and from earlier research in the United Kingdom. Additional design insight has been gained from the experience of various stopped and stowed rotor concepts of the 1960's and also from recent studies of the NASA 'oblique wing' transonic transport concept. (Author)

AD-A029 212/8GA PC$3.50/MF$3.00
Human Engineering Lab Aberdeen Proving Ground Md
An Investigation of Cockpit Lighting for Compatibility with Use of Night-Vision Goggles, AN/PVS-5.
Final rept.,
Harry R. Stowell. Jul 76, 21p Rept no. HEL-TM-26-76

Descriptors: *Lighting equipment, *Cockpits, *Electromagnetic compatibility, *Night vision devices, Airborne, Helicopters, Human factors engineering, Goggles, Floodlights, Instrument landings, Indicator lights.
Identifiers: AN/PVS-5, Cockpit lighting, UH-1D aircraft.

Cockpit lighting in U. S. Army helicopters was investigated for compatibility with use of night-vision goggles, AN/PVS-5. Instrument-lighting systems in existing Army helicopters, e.g., eyebrow lighting, post lighting, are not suitable for use with night-vision goggles. A comparatively simple flood-lighting system can provide suitable lighting in the cockpit of existing helicopters for reading instruments with night-vision goggles. The most suitable instrument-

lighting system for use with the goggles is integral instrument lighting; however, indicator lights need to be modified so they are compatible with the goggles. Methods were investigated for instantaneously refocussing the goggles inside the cockpit. Luminance levels compatible for use with night-vision goggles are stated in photometric terms. (Author)

AD-A029 242/5GA PC$6.75/MF$3.00
Lockheed-California Co Burbank
Feasibility and Tradeoffs of a Transport Fuselage Fire Management System.
Final rept. Jul 75-Apr 76,
Philip S. Starrett, E. Lopez, B. Silverman, J. Susersky, and J. Logan. Apr 76, 167p LR-27477, FAA-RD-76-54
Contract DOT-FA75WA-3657

Descriptors: *Aviation safety, *Aircraft fires, Fire extinguishers, *Jet transport planes, *Commercial aircraft, *Fire safety, Feasibility studies, Trade off analyses, Fire resistant materials, Fire resistant textiles, Fire detectors, Monitors, Pyrolysis, Monitors, Fire extinguishing agents, Fuselages.

A feasibility investigation and tradeoff analysis was performed on two approaches to increase fire safety for a hypothetical aircraft: (1) an integrated Fire Management System, incorporating fire detection, monitoring, and suppression, and (2) improved non-metallic materials with greater fire retardancy and lower emission of hazardous pyrolysis products. Fire-related accident and incident data over a 10-year period were analyzed. Then the fire safety aspects of the hypothetical aircraft were studied on a zone-by-zone basis. A survey was made of the relevant available technology to upgrade the aircraft fire protection. A fire detection, monitoring, and extinguishing system based on this technology was outlined. Candidate material improvements were identified. The two approaches were defined in terms of performance, economics, and timeliness. Performance and cost factors favored a fire management system over improved materials. Unresolved technical problems existed with both approaches, and both involved substantial weight and economic increases. The fire management system appeared to have an advantage in timely availability, particularly since some of the qualifying tests for improved materials still need to be developed and accepted. Technology currently exists to provide an effective early-warning fire detection and monitoring system. A safe, effective extinguishing agent suitable for a cabin fire suppression system has yet to be fully demonstrated. (Author)

AD-A029 248/0GA PC$4.00/MF$3.00
Systems Technology Inc Hawthorne Calif
Identification of Minimum Acceptable Characteristics for Manual STOL Flight Path Control. Volume I. Summary Report.
Final rept.,
Roger H. Hoh, Samuel J. Craig, and Irving L. Ashkenas. Jun 76, 47p STI-TR-1035-3R-I, FAA-RD-75-123-1
Contract DOT-FA73WA-3276
See also Volume 2, AD-A013 588.

Descriptors: *Flight control systems, *Short takeoff aircraft, *Instrument landings, Stabilization systems, Flight paths, Mathematical models, Stability, Dynamic response, Flight simulators.

Characteristics of powered lift STOL airplanes that lead to unacceptable flight path control for approach and landing are identified. Most of the findings are based on the results of a piloted ground based simulator program. However, a short variable stability flight test program was conducted to allow interpretation of the simulation landing results in light of a flight environment. This report (Volume I) contains a comprehensive summary of the overall program including all of the significant results that were obtained. An important part of the research was an investigation of generic characteristics of various STOL concepts. This is reported in Volume II along with the generic STOL simulation model used in this program. Finally, Volume III contains the detailed analysis techniques used to analyze the experimental data. Also included in Volume III is a complete description of all the tested vehicles. (Author)

AD-A029 250/8GA PC$7.75/MF$3.00
Systems Technology Inc Hawthorne Calif
Identification of Minimum Acceptable Characteristics for Manual STOL Flight Path Control. Volume III. Detailed Analyses and Tested Vehicle Characteristics.
Final rept.,
Roger H. Hoh, Samuel J. Craig, and Irving L. Ashkenas. Jun 76, 218p STI-TR-1035-3R-III, FAA-RD-75-123-3
Contract DOT-FA73WA-3276
See also Volume 1, AD-A029 249.

Descriptors: *Flight control systems, *Short takeoff aircraft, *Instrument landings, Manual operation, Stabilization systems, Stability, Dynamic response, Flight paths, Flight simulators.

This report presents the detailed results and analysis procedures utilized to identify minimally acceptable flight path control characteristics of powered lift STOL airplanes. Deficiencies in flight path control are identified via closed loop analysis of describing function results obtained during the simulation. Unacceptable characteristics for flare and landing are identified from correlations of pilot rating and commentary with key parameters obtained from closed loop pilot-vehicle analysis. A more concise summary of the overall program and the results is contained in Volume I. (Author)

AD-A029 266/4GA PC$3.50/MF$3.00
Army Training Support Center, Fort Eustis, Va.
Army Flight Simulator Programs from the User's Viewpoint,
Juri Toomepuu. 12 May 76, 15p
Presented at Topical Review, Training Devices and Flight Simulators, conducted by Office of the Director of Defense Research and Engineering, 10-13 May 76.

Descriptors: *Flight simulators, Army training, Aviation personnel, Cost effectiveness, Pilots, Training devices, Research management, Operational effectiveness, Acceptability, Test methods, Army aviation.
Identifiers: User needs.

The presentation covers three topics: (1) User evaluation of the quality and suitability of the Army flight simulator program; (2) cost effectiveness of flight simulators and (3) research initiatives needed to meet Army aviation training needs.

AD-A029 269/8GA PC$4.50/MF$3.00
Aeronautical Systems Div Wright-Patterson AFB Ohio
Development and Evaluation of a Parachute Recovery System for the B-1 Aircraft Flight Data Recorder.
Final rept. Mar-Jun 74,
Daniel J. Kolega. Jul 75, 55p Rept no. ASD-TR-75-5

Descriptors: *Jet bombers, *Flight recorders, *Recovery, Air drop operations, Parachutes, Parachute descents, Parachute canopies.
Identifiers: B-1 aircraft, *Parachute recovery systems.

Evaluation of a contractor designed parachute recovery system for the B-1 Crash Data Recorder/Crash Position Indicator (CDR/CPI) resulted in a 45-inch diameter solid flat canopy design effort by the ASD Parachute Branch at Wright-Patterson AFB, Ohio. The recovery system performance was evaluated through a series of static deployment tests, low speed helicopter airdrop tests at Wright-Patterson AFB, and high speed deployment tests conducted at the Whirl Tower Facility located at the National Parachute Test Range, El Centro, California.

AD-A029 270/6GA PC$7.50/MF$3.00
Aeronautical Systems Div Wright-Patterson AFB Ohio
Development of a High/Low Q Aircraft Recovery Parachute System.
Final rept. Nov 72-Nov 73,
Daniel J. Kolega. Feb 76, 177p Rept no. ASD-TR-76-4

Descriptors: *Jet fighters, *Spin recovery parachutes, Parachute packs, Wind tunnel tests, Deployment.
Identifiers: F-111 aircraft.

Various concepts were studied for providing a high/low q recovery parachute to recover aircraft in uncontrollable maneuvers at both high and low dynamic pressure. Fixed time delay skirt reefing was selected and a packing investigation was conducted to determine if it is possible to install such a parachute system in existing spin recovery parachute compartments. Finally, a wind tunnel test rogram was conducted to determine the feasibility of reefing spin recovery parachutes to extend their performance range. Throughout all tests a positive force held the chute outstretched in the wake of the spinning aircraft model demonstrating the feasibility of the reefing concept. The technology gained from this effort is applicable to most new aircraft systems (as the F-15, F-14, F-5, and lightweight fighters), and could permit more extensive and safer flight testing at high speed near stall conditions.

AD-A029 345/6GA PC$7.75/MF$3.00
Boeing Commercial Airplane Co Seattle Wash
Design and Analysis of Winglets for Military Aircraft.
Final rept. 16 Jun-25 Nov 75,
K. K. Ishimitsu, N. VanDevender, R. O. Dodson, P. C. Brault, and B. A. Byers. 3 Feb 76, 203p D6-41799, AFFDL-TR-76-6
Contract F33615-75-C-3123

Descriptors: *Sweptback wings, Wings, *Wing tips, Jet transport planes, Tanker planes, Drag, Strakes, Feasibility studies, Drag reduction, Costs, Weight, Load distribution, Bending, Composite materials, Aluminum alloys, Skin(Structural), Installation, Extendable structures, Flutter, Stresses, Modification, Mathematical models, Mathematical prediction, Mathematical analysis, Attachment, *Military aircraft.
Identifiers: *Winglets, Induced drag, KC-135A Aircraft, C-135 Aircraft, C-141 Aircraft.

A study of the design and analysis on winglets for military Aircraft has been completed. The program consisted of investigating analytically winglet concepts for application to the KC-135 and C-141 designing and building winglets for an 0.035 and 0.070 scale model KC-135, and conducting a structural feasibility investigation of the winglet installation on the KC-135. The analysis of the winglets showed a 14% reduction in induced drag for the KC-135 and a 11% reduction for the C-141. The structural design study of the KC-135A winglet installation estimated a 592 lb weight increase. An 8.4% improvement was estimated in M(L/D) sub MAX and an 8.1% improvement in range factor for the KC-135A. An 0.070 scale half span KC-135

wind tunnel model has been tested in the NASA 8 Ft Transonic Tunnel. Preliminary unpublished test data have substantiated the analytical procedures used by The Boeing Company to determine the aerodynamic characteristics and performance benefits from winglets on the KC-135 aircraft. (Author)

AD-A029 372/0GA PC$5.00/MF$3.00
Hughes Helicopters Culver City Calif
Analytical Investigation of an Improved Helicopter Landing Gear Concept.
Final rept. 30 Jun 75-19 Feb 76,
A. H. Logan. Aug 76, 88p HH-76-37, USAAMRDL-TR-76-19
Contract DAAJ02-75-C-0045

Descriptors: *Landing gear, *Helicopters, Rotor blades(Rotary wings), *Skids, Pitch(Motion), Life cycle costs, Cost analysis, Roll, stress analysis, Energy absorbers, Weight, Resonance.
Identifiers: OH-6A Aircraft, H-6 Aircraft, Tailboom interference, Design, Autorotation, *Helicopter rotors.

A design study has been conducted to define a landing gear concept that redistributes the impact energy of an autorotational landing in a manner that minimizes the occurrence of blade/tailboom strikes. The landing gear concept redistributes the impact energy by providing an interconnection between the front and rear landing gears. Through the interconnection, as the rear landing gear moves from the flight static position toward the full in position under landing impact, the front gear is impelled to move from the flight static position toward the full out position. When these motions have been accomplished, the skids (or front and rear wheels) are on the ground surface and the reactions inherent in absorbing the autorotational landing do not produce a pitching moment. A physical design was developed for the OH-6A and compared to the landing gear provisions of MIL-STD-1290. Ground resonance, weight, and life cycle cost analyses were also performed. The analysis indicates that pitch interconnection significantly reduces the nose-down pitching moment that occurs during nose-high autorotation. This increases blade/tailboom spacing, which eliminates the majority of blade/tailboom strikes. Roll interconnection increases the ground resonance boundaries threefold. (Author)

AD-A029 375/3GA PC$9.75/MF$3.00
Advisory Group for Aerospace Research and Development Paris (France)
Advanced Techniques in Crash Impact Protection and Emergency Egress from Air Transport Aircraft,
Richard G. Snyder. Jun 76, 310p Rept no. AGARD-ograph-221
Summary in French. NATO furnished.

Descriptors: *Passenger aircraft, *Aviation accidents, *Aircraft fires, *Aviation safety, *Transport aircraft, *Commercial aircraft, Jet transport planes, Escape systems, Death, Aviation injuries, Smoke, Toxic hazards, Evacuation, Aircraft seats, Inflight, Emergencies, Bibliographies, Tables(Data), Technology, Safety equipment, Impact, Fire protection, Fumes, Protective equipment, NATO.
Identifiers: *Crashworthiness, Survival(Personnel).

Analysis of all NATO member air transport accidents, 1964-1975, revealed that injuries and fatalities, when such information could be determined, were primarily due to the post-crash effects of fire, smoke and toxic fumes, and secondarily to crash impact. Future air transport design trends were reviewed, and approximately 150 advanced crash-impact and emergency-egress concepts, devices, and state-of-the-art techniques were evaluated. These included occupant restraints, smoke hoods, aisle and egress emergency lighting, passenger warning systems, escape slides and devices, heat shields, high-energy emergency egress systems, and emergency inflight egress systems. It was concluded that rear-facing passenger seats, the NASA Ames (21 + G sub x 45 G sub z) airline seat, and the production Sheldahl smoke hood can provide significantly improved occupant protection, while high-energy emergency egress systems appear promising for future aircraft. More research is needed to improve passenger warning and public address systems. Concepts of emergency inflight egress are not yet feasible, although technically within the state-of-the art.

AD-A029 388/6GA PC$7.75/MF$3.00
Kaman Avidyne Burlington Mass
NOVA-2 -- A Digital Computer Program for Analyzing Nuclear Overpressure Effects on Aircraft. Part 1. Theory.
Final rept.,
William N. Lee, and Lawrence J. Mente. Aug 76, 212p KA-TR-128-Pt-1, AFWL-TR-75-262-Pt-1
Contract F29601-75-C-0032
See also AD-A029 389.

Descriptors: *Aircraft, *Nuclear explosion damage, *Computer programming, Overpressure, Vulnerability, Blast waves, Blast loads, Structural response, FORTRAN.
Identifiers: NOVA 2 computer program, FORTRAN 4 programming language.

NOVA-2 (Nuclear Overpressure Vulnerability Analysis, Version 2) is an updated version of NOVA, a FORTRAN-4 digital computer program for calculating the response of individual structural elements of aircraft, such as stringers, frames and panels, exposed to the transient pressure loading associated with the blast wave from a nuclear explosion. The updated version extends the capability of NOVA to analyze rib elements, frames with variable cross section, and offers a choice of clamped, simply supported or free edge boundary conditions. For inelastic structural response, a much improved elastic-plastic model for material behavior is provided. Also added to NOVA is the REFRA near-ground reflections model for blast waves. The program still provides the overall capability to analyze multilayered beam and panel elements exposed to a steady-state subsonic or supersonic aerodynamic preload, followed by a dynamic blast wave. A critical slant range is automatically determined in an iteration where damage criteria (specified on a probabilistic basis) are compared with the structural response.

AD-A029 389/4GA PC$6.75/MF$3.00
Kaman Avidyne Burlington Mass
NOVA-2 -- A Digital Computer Program for Analyzing Nuclear Overpressure Effects on Aircraft. Part 2. Computer Program.
Final rept.,
William N. Lee, and Lawrence J. Mente. Aug 76, 155p KA-TR-128-Pt-2, AFWL-TR-75-262-Pt-2
Contract F29601-75-C-0032
See also AD-A029 388.

Descriptors: *Aircraft, *Nuclear explosion damage, *Computer programming, Overpressure, Vulnerability, Blast waves, Blast loads, Structural response, FORTRAN.
Identifiers: NOVA 2 computer program, FORTRAN 4 programming language.

NOVA-2 (Nuclear Overpressure Vulnerability Analysis, Version 2) is an updated version of NOVA, a FORTRAN-4 digital computer program for calculating the response of individual structural elements of aircraft, such as stringers, frames and panels, exposed to the transient pressure loading associated with the blast wave from a nuclear explosion. The updated version extends the capability of NOVA to analyze rib elements, frames with variable cross section, and offers a choice of clamped, simply supported or free edge boundary conditions.

AD-A029 397/7GA PC$3.50/MF$3.00
Army Aviation Test Board Fort Rucker Ala
Preliminary Evaluation of the Prestwick Twin Pioneer.
Final rept.
12 Apr 57, 7p Rept no. USAATB-AVN-157

Descriptors: *Utility aircraft, *Transport aircraft, Short takeoff aircraft, Army aircraft, Aerodynamic stability, Flight testing, Payload analyses, Cargo, Range(Distance), *Aerodynamic characteristics.
Identifiers: Prestwick twin pioneer aircraft, Twin pioneer aircraft.

Flight tests on the Prestwick Twin Pioneer indicated it possesses features which impart relative short take-off and landing characteristics considered desirable for Army light-cargo aircraft. The Prestwick Twin Pioneer does not have sufficient weight-carrying and radius-of-action capabilities to meet the stated Army requirements for a light-cargo aircraft. The stability and control of the Prestwick Twin Pioneer is adequate to meet Army requirements; however, it does not offer advantages over present Army utility aircraft in this respect.

AD-A029 399/3GA PC$3.50/MF$3.00
Army Aviation Test Board Fort Rucker Ala
Study of Air Transportability of the H-34A Helicopter in Transport Aircraft.
Final rept.
Nov 56, 9p Rept no. USAATB-AVN-3656

Descriptors: *Helicopters, *Jet Transport planes, *Transport aircraft, Aircraft maintenance, Assembly, Disassembly, Handling.
Identifiers: Field conditions, H-34A aircraft, C-124 aircraft, XC-132 aircraft, XC-123 aircraft, H-34 aircraft, Transportable.

Two H-34A Helicopters, each with crews of six men, when disassembled and placed on skids which do not raise the silhouette more than four inches could be air-transported in C-124, XC-132 and XC-123 aircraft.

AD-A029 434/8GA PC$3.50/MF$3.00
Army Aviation Test Board Fort Rucker Ala
Evaluation of the Kit, Rain Repellent (Snell Nr 2911C-1728S).
Final rept.
Aug 56, 9p Rept no. USAATB-AVN-1156

Descriptors: *Windshields, *Weatherproofing, Rain, Visibility, Test and evaluation, Field tests, Helicopters.
Identifiers: *Aircraft windshields, L-19 aircraft, L-20 aircraft, H-13 aircraft, H-23 aircraft.

The purpose of this test was to conduct an evaluation of the F. D. Snell Corporation Kit, Rain Repellent (Snell Nr 2911C-1728S) to determine its suitability for use on Army aircraft under field conditions. The repellent was tested utilizing L-19 and L-20 Airplanes, and H-13 and H-23 Helicopters. After application of repellent to one half of each windshield, these aircraft were flown a total of 20 hours in rain of varying intensity, at indicated airspeeds ranging from 0 to 120 miles per hour.

PATENT-3 958 780 Not available NTIS
Department of the Navy Washington D C
Convertible Canopy-to-Wing Shaped Parachute.
Patent,
Jon T. Matsuo, and Lajpat Utreja. Filed 9 Apr 75, patented 25 May 76, 6p AD-D002 836/5, PAT-APPL-566 459
Supersedes AD-D000 725.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Parachutes, *Parachute canopies, *Patents, Parachute descents, Deployment, Lift to drag ratio, Gliding.
Identifiers: PAT-CL-244-152.

The patent relates to a standard hemispherical parachute canopy which can be converted optionally by the parachutist during a deployment from its fully inflated dome-shaped condition to a high lift-over-drag configuration. This enables the parachute to be propelled and maneuvered to a desirable pick up area to avoid capture by the enemy during wartime conditions, and to minimize injury by selecting a more favorable terrain for landing.

PATENT-3 966 146 Not available NTIS
Department of the Air Force Washington D C
Air Bladder Seat Cushion for High Acceleration Cockpit.
Patent.
Edward O. Roberts. Filed 10 Mar 75, patented 29 Jun 76, 6p AD-D002 855/5, PAT-APPL-556 987
Supersedes AD-D000 685.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Ejection seats, *Cockpits, Cushioning, Inflatable structures, Tolerances(Physiology), High acceleration, Fighter aircraft.
Identifiers: PAT-CL-244-122.

The patent concerns a high acceleration cockpit-ejection seat having an air bladder-liner element acting as a cushion/pad and inflatable to effectively provide a significant backward tilt to, and thus greatly increase the pilot's tolerance to the high g-loads associated with fighter aircraft maneuvering at high speeds.

1D/054Aircraft Flight Control and Instrumentation

AD-A029 467/8GA PC$6.75/MF$3.00
Lear Siegler, Inc., Wright-Patterson AFB, Ohio. Management Services Div.
C-141 All Weather Landing System Engineering Support.
Final rept. 7 Aug 72-31 Oct 75,
John S. Kozina. Jun 76, 153p AFFDL-TR-76-46 . Contract F33615-72-C-1358
Sponsored in part by Federal Aviation Administration, Washington, D.C. Systems Research Development Service.

Descriptors: *Cargo aircraft, *All weather aviation, *Aircraft landings, Flight instruments, Automatic pilots, Landing aids, Approach indicators, Radar.
Identifiers: C-141 aircraft, *All weather landing systems.

The systd1ms and dquipment described augment the capability of the standard C-141 Category II All Weatheq Landing Systd1m (AWLS) to operate in Category III weather conditions. This final report describes the physical location, operation, and theory of operation of the 7individual systems. A description of the onboard test instrumentation used to document the results of the AWLS test flights is included. A simulation model of the NC-141A test aircraft was developed to facilitate analysis of an AWLS operation on a system mock-up. The aircraft equations of motion which were used and the results of the simulation model testing are a part of this report.

AD-A029 541/0GA PC$4.00/MF$3.00
National Aviation Facilities Experimental Center Atlantic City N J
Independent Altitude Monitor: A Literature Search, Analysis, and Bibliography.
Final rept. May 74-Jul 75,
Jack J. Shrager. Aug 76, 49p FAA-NA-76-2, FAA-RD-76-127

Descriptors: *Terrain avoidance, *Collision avoidance, *Ground position indicators, Aircraft, Flight paths, Altitude, Monitors, Monitoring, Proximity devices, Warning systems, Terrain, Terrain analysis radar, Optical detectors, Literature surveys.
Identifiers: *Altitude monitoring, *Aircraft navigation.

A literature search of recent activity to provide an independent indication of aircraft altitude was undertaken. Results indicate that there are several existing techniques in use which can readily be expanded to enhance altitude awareness to avoid inadvertent terrain collisions. Also identified are other new potential candidate systems concepts. (Author)

1E. Air Facilities

AD-A029 422/3GA PC$9.25/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Climatic Effects on Airport Pavement Systems State of the Art.
Final rept. Oct 74-May 75,
Barry J. Dempsey. Jun 76, 285p FAA-RD-75-196

Descriptors: *Pavements, *Landing fields, *Climate, Runways, Pavement bases, Civil engineering, Surface temperature, Moisture content, Predictions, Surfaces, Strength(Mechanics), Stiffness, Heat transfer, Soil mechanics, Cements, Asphalt, Mechanical properties, Physical properties, Frost heave, State of the art, Methodology.
Identifiers: Design.

This state-of-the-art report reviews the climatic parameters important to airport pavement design, the methodology by which climatic parameters are used to predict pavement design parameters, and the methodology by which climatic parameters are incorporated into design procedures. Methods for predicting temperature and moisture conditions in the pavement system are discussed. Also the pavement distresses which result from temperature and moisture effects are reviewed. The report includes a comprehensive discussion of the methodology for assessing the influence of climatic parameters on the properties of the airport pavement materials. Probabilistic procedures for evaluating the influence of climate on pavement systems are described. In conclusion, a brief summary of methodologies which could be used to include climatic parameters in airport pavement design is presented. (Author)

AD-A029 659/0GA PC$4.00/MF$3.00
Federal Aviation Administration Washington D C Office of Aviation Policy
Military Aviation Forecasts Fiscal Years 1977-1988.
Aug 76, 27p Rept no. FAA-AVP-76-15

Descriptors: *Military aircraft, *Air traffic, United States, Air transportation, Forecasting, Terminal flight facilities, Landing fields, Civil aviation, Inflight, Time, Military procurement.
Identifiers: Federal Aviation Administration.

This report presents forecasts of military air traffic activity at facilities operated by the Federal Aviation Administration for fiscal years 1977 through 1988. These data are required for proper planning to meet the demands which the United States military services will place on the National Aviation System. The report is used as a guide in determining the need for larger or additional FAA facilities, for changes or consolidations, and for increases or decreases in personnel at existing facilities. Data on number of active military aircraft and hours flown were supplied by the office of Secretary of Defense. Data covers the period fiscal years 1977-1983 for the three military services. Because detailed planning data beyond this timeframe were not available from the Department of Defense, the 1983 levels were extended forward for general planning guidance for 1984-1988. The federal Government's fiscal year changed to October 1-September 30 beginning in 1976 as part of the new law revamping the entire budgetary process. This is one of a series of specialized forecast studies issued annually by the FAA Aviation Forecast Branch, Office of Aviation Policy. Suggestions and comments on the scope and content of this report are requested and will be given careful consideration in planning future editions. (Author)

2. AGRICULTURE

2B. Agricultural Economics

PB-256 401/1GA PC$6.00/MF$3.00
Red Bluff-Tehama County Chamber of Commerce, Calif.
Wine Grape Production, Tehama County Feasibility Study, Tehama County, California,
John L. Bree, and William S. Witzke. Dec 75, 144p EDA-76-024
Grant EDA-07-6-01440

Descriptors: *Grapes, *Wines, *Economic development, Climate, Feasibility, Water quality, Atmospheric temperature, Environmental impacts, Transportation, Soils, Market research, Land use, Employment, Technical assistance, California, Production.
Identifiers: *Tehama County(California).

The county of Tehama began thinking about the possibility of establishing countywide wine industry. Conditions for growing were different a few years ago. Water and land in a few areas of California were found feasibile to grow grapes. Unemployment rate was high and in conjunction with the County Board of Supervisors and EDA, a contract to proceed with the feasibility study was signed in October of 1974.

PB-256 594/3GA PC$9.25/MF$3.00
California Univ., Davis. Dept. of Agricultural Economics.
A Quadratic Programming Approach to the Production of California Field and Vegetable Crops Emphasizing Land, Water and Energy Use.
Doctoral thesis,
Richard Melvin Adams. Aug 75, 277p W76-11326

Descriptors: *Agricultural economics, *Fuels, *Fertilizers, *Farm crops, *Vegetable crops, *Water supply, *Land use, Cost analysis, Grain crops, Food supply, Theses, Supply(Economics), Demand(Economics), Petroleum products, Diesel fuels, Water consumption, Prices, Economic models, Nonlinear programming, California.
Identifiers: Energy use.

California agriculture is continually adjusting to changing demand and supply conditions, but the events associated with the 'energy crisis' of 1973-74 appeared as an abrupt shift in production conditions rather than a random shock or a gradual trend in events of the past. An additional shock was adverse weather conditions in

several important grain producing areas of the world resulting in increasing concern over food supplies both in the U.S. and abroad, and the associated inflation due to rising food and energy prices. This thesis explores the effects of increases in energy costs (gasoline and diesel fuels) and energy-based inputs (nitrogen fertilizer) on the cropping pattern in California for an important set of commodities including major vegetable and field crops under alternative assumptions as to demand for the commodities. Portions of this document are not fully legible.

2C. Agricultural Engineering

PB-256 514/1GA PC$5.50/MF$3.00
Iowa State Water Resources Research Inst., Ames.
Effect of Tillage Systems on Runoff Losses of Pesticides; A Simulated Rainfall Study.
Completion rept. Jul 74-Jun 75,
James L. Baker, Howard P. Johnson, and John M. Laflen. Jun 76, 108p ISWRRI-71, W76-11169, , OWRT-B-050-1A(1)
Contract DI-14-31-0001-5073

Descriptors: *Water pollution abatement, *Cultivation, *Rainfall, *Runoff, *Pesticides, Simulation, Soil erosion, Herbicides, Slope, Concentration(Composition), Residues, Drift, Insecticides, Sediments, Water loss, Sources, Corn plants, Iowa.
Identifiers: *Path of pollutants, Lasso, Bladex, Dyfonate, Alachlor, Cyanazine, Fonofos.

Pesticide losses were measured from small plots subjected to simulated rainfall. The plots were established at three locations in Iowa, each with different soils and slopes. The plots were tilled parallel to the slope by six different tillage practices. One insecticide (fonofos) and two herbicides (alachlor and cyanazine) were applied to the soil at recommended rates shortly before simulating two rains at 6.35 cm/hr and a third at 12.7 cm/hr (totalling 21.6 cm). Concentrations of all three pesticides in both sediment and water samples decreased significantly with time. Pesticide concentrations in water were correlated with percent residue cover.

PB-257 157/8GA PC$4.00/MF$3.00
Robert S. Kerr Environmental Research Lab., Ada, Okla.
Overland Flow Treatment of Raw Wastewater with Enhanced Phosphorus Removal.
Final rept. Mar 71-Jun 73,
R. E. Thomas, B. Bledsoe, and K. Jackson. Jun 76, 45p EPA/600/2-76/131

Descriptors: *Sewage treatment, *Irrigation, Climate, Nitrogen cycle, Runoff, Waste water, Phosphorus cycle, Removal, Biochemical oxygen demand, Design, Efficiency.
Identifiers: *Overland flow, *Sewage irrigation.

A pilot-scale field study was conducted to evaluate the capability of overland flow to provide complete treatment of raw comminuted wastewater on a year-round basis in a mild climatic zone. Raw comminuted wastewater was applied through a specially designed distribution system which operated at low pressure and prevented the formation of aerosols. This specially designed applicator operated at a pressure of 1.0 kg/sq cm (15 psi) and was used to apply wastewater to three experimental plots at 7.4, 8.6, and 9.8 cm/week rates of loading. Wastewater and plot runoff samples were collected periodically to compare treatment efficiencies for the three loading rates and to determine seasonal influences on treatment efficiency. Fifteen parameters including suspended solids, biochemical oxygen demand, nitrogen, and phosphorus were used to evaluate treatment efficiencies. The results of this 18-month field study showed overland flow to be an effective process for achieving advanced waste treatment of raw comminuted wastewater via a simple system with no sludge production.

PB-257 440/8GA PC$7.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Municipal Construction Div.
Evaluation of Land Application Systems.
Technical bulletin.
Mar 75, 190p* EPA/430/9-75/001, EPA/MCD-07
See also PB-257 439.

Descriptors: *Sewage treatment, *Irrigation, Fluid infiltration, Water quality management, Agriculture, Waste water reuse, Forestry, Aquaculture, Water reclamation, Water pollution control, Farm crops, Evaluation, Maintenance, Operations, Design, Environmental impacts, Monitoring, Percolation.
Identifiers: Federal Water Pollution Control Act Amendments of 1972, *Overland flow, *Best technology, *Sewage irrigation, Alternative planning.

The technical bulletin is published pursuant to certain sections of the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, enacted on October 18, 1972. The 1972 Amendments require the publication of information that will encourage waste treatment management which results in facilities for (1) The recycling of potential sewage pollutants through the production of agricultural, silvicultural, or aquacultural products; (2) The reclamation of wastewater; and (3) The elimination of the discharge of pollutants. The Amendments also require the consideration of alternative waste management techniques that provide the best practicable waste treatment technology over the life of the treatment works.

2F. Forestry

PB-256 567/9GA PC$3.50/MF$3.00
North Central Forest Experiment Station, St. Paul, Minn.
Estimating Red Pine Site Index in Northern Minnesota.
Forest Service research paper,
David H. Alban. 1976, 19p FSRP-NC-130

Descriptors: *Pine trees, *Estimating, *Site surveys, Structural timber, Plant growth, Height, Soil properties, Field tests, Softwoods, Spruce wood, Age, Silviculture, Forestry, Minnesota.
Identifiers: Pinus resinosa, Site index, Populus tremuloides.

Methods are presented for estimating Red Pine site index from the height growth of red pine, site index of several associated species (Jack Pine, White Pine, White Spruce, or Quaking Aspen), and from easily measured soil properties. The restrictions and limitations of each method and their relative precision are discussed.

PB-257 029/9GA PC$5.00/MF$3.00
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
Evaluation of ERTS-1 Data for Forest and Rangeland Surveys.
Forest Service research paper (Final),
Robert C. Heller. 1975, 78p* FSRP-PSW-112

Descriptors: *Forest land, *Range grasses, *Spaceborne photography, Remote sensing, Scientific satellites, Photographic images, Inventories, Photointerpretation, Color photography, Accuracy, Georgia, Colorado, Statistical analysis, Land use, Vegetation, Identifying, Forest fires, Plant diseases, Damage, South Dakota, California.
Identifiers: ERTS-1 satellite, Computer aided mapping.

Tests used data gathered by the first Earth Resource Technology Satellite. Results on sites in Georgia, Colorado, and South Dakota indicated that ERTS enlargements, preferably color, would be useful to forest managers of large ownerships for broad area planning. Forest land was distinguished from non-forest land with 90 to 95 percent accuracy, in both photointerpretation and computer-assisted analysis. Further breakdowns of cover types could not be made with acceptable accuracy by either method. Forest disturbances from natural causes or human activity could be detected with 90 percent accuracy when ERTS imagery was compared with 6-year-old aerial photos. Stress from mountain pine beetle could not be detected; ERTS wavebands are too broad to identify dying foliage. Color illustrations reproduced in black and white.

PB-257 126/3GA PC$3.50/MF$3.00
North Central Forest Experiment Station, St. Paul, Minn.
Wilderness Ecology: A Method of Sampling and Summarizing Data for Plant Community Classification.
Forest Service research paper,
Lewis F. Ohmann, and Robert R. Ream. 1971, 19p FSRP-NC-49
See also PB-234 212.

Descriptors: *Forest land, *Plants(Botany), Classifications, Forestry, Ecology, Forest trees, Soils.
Identifiers: Wilderness areas, Silviculture, Plant communities.

The report presents a flexible sampling scheme that researchers and land managers may use in surveying and classifying plant communities of forest lands. It includes methods, data sheets, and computer summarization printouts.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

PB-247 137-380-1/GA MF$3.00
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 380. Part I. (Prompt Reports). Data for March 1976-February 1976. Explanation of Data Reports Issued as Number 378 (Supplement) February 1976,
Hope I. Leighton. Apr 76, 126p SGD-380-Pt-1, NOAA-76051112
See also PB-247 137-380-2 and PB-247 137-379-1.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.50/copy for either part; $1.40 for the extra issue.

Descriptors: *Solar activity, Ionospheric disturbances, Solar flares, Solar cosmic rays, Solar radio emission, Geomagnetism, Solar x rays, Magnetic disturbances, Solar wind, Sunspots, Sudden ionospheric disturbances, Tables(Data), Indexes(Documentation), Graphs(Charts), Statistical data, Scientific satellites.
Identifiers: Interplanetary magnetic fields, Spectroheliograms, D2-B Aura French satellite, D2-B satellite.

This report includes imageries that measure solar brightness. The D2-B satellite launched from French Guyana on September 27, 1975, has been collecting spectroheliograms in the wavelength range 170-1300A since October 15,

1975. Spectroheliograms at the wavelength of the 284 A FeXV line are received on a daily basis.

PB-247 137-380-2/GA MF$3.00
National Geophysical Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 380. Part II. (Comprehensive Reports). Data for October 1975-September 1975 and Miscellanea. Explanation of Data Reports Issued as Number 378 (Supplement) February 1976,
Hope I. Leighton. Apr 76, 34p SGD-380-Pt-2, NOAA-76051113
See also PB-247 137-380-1 and PB-247-137-379-2.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.50/copy for either part; $1.40 for the extra issue.

Descriptors: *Solar activity, Solar cosmic rays, Solar flares, Solar radio emission, Solar wind, Solar physics, Plasmas(Physics), Electrons, Protons, Tables(Data), Indexes(Documentation), Graphs(Charts), Statistical data, Scientific satellites.
Identifiers: Spectroheliograms, D2-B Aura French satellite, D2-B satellite, IMP-7 satellite, IMP-8 satellite.

This is part two of Solar-Geophysical Data No. 380. Included is data that gives measurements of solar activity for the months October and September 1975. These data reports are based on the D2-B satellite results which was launched from French Guyana and which has been collecting spectroheliograms.

PB-247 137-381-1/GA MF$3.00
National Geophysical Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 381. Part I. (Prompt Reports). Data for April 1976-March 1976. Explanation of Data Reports Issued as Number 378 (Supplement) February 1976,
Hope I. Leighton. May 76, 131p SGD-381-Pt-1, NOAA-76062938
See also PB-247 137-380-1 and PB-247 137-381-2.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.50/copy for either part; $1.40 for the extra issue.

Descriptors: *Solar activity, Solar flares, Solar radio emission, Solar wind, Solar x rays, Sudden ionospheric disturbances, Solar cosmic rays, Magnetic storms, Geomagnetism, Magnetic disturbances, Sudden commencements, Sunspots, Tables(Data), Graphs(Charts), Indexes(Documentation), Scientific satellites.
Identifiers: SMS-2 GOES satellite, Interplanetary magnetic fields, Solar protons.

This report includes charts and imageries of solar activity recorded for the months of March and April of 1976. April's data includes: daily solar activity centers; sudden ionospheric disturbances; solar radio waves; cosmic rays; geomagnetic indices; and radio propagation indices.

PB-247 137-381-2/GA MF$3.00
National Geophysical Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 381. Part II. (Comprehensive Reports). Data for November 1975-October 1975 and Miscellanea. Explanation of Data Reports Issued as Number 378 (Supplement) February 1976,
Hope I. Leighton. May 76, 52p SGD-381-Pt-2, NOAA-76062939
See also PB-247 137-380-2 and PB-247 137-381-1.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.50/copy for either part; $1.40 for the extra issue.

Descriptors: *Solar activity, Solar flares, Solar radio emission, Magnetic storms, Magnetic disturbances, Solar cosmic rays, Tables(Data), Graphs(Charts), Indexes(Documentation), Electrons, Protons, Alpha particles.
Identifiers: IMP-7 satellite, IMP-8 satellite.

This is part two (comprehensive reports) of a two part report on Solar-Geophysical Data. Included in this report are data for the months of October and November. The data recorded include: solar flares; solar radio waves; energetic solar particles and plasma; magnetograms of geomagnetic storms.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A029 155/9GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
A Compilation of Solar Data for White Sands Missile Range,
Paul H. Taft, and Darl G. McCullough. May 76, 26p Rept no. DR-916

Descriptors: *Sunlight, *Solar radiation, Intensity, Sunrise, Sunset, Time, Daylight, Twilight, Altitude, Azimuth, Shadows, Earth(Planet), Guided missile ranges, New Mexico, Tables(Data).

Tables and graphs are presented, with explanatory text, giving times of sunrise and sunset, duration of daylight, twilight and darkness, solar altitudes and azimuths, the Earth's shadow height, and related data frequently used at White Sands Missile Range. Because of increased interest in solar energy, a new section called solar radiation intensities has been included. (Author)

AD-A029 324/1GA PC$3.50/MF$3.00
Stanford Research Inst Menlo Park Calif
On Seeding the D-Region with Cesium.
Technical note,
J. W. Chamberlain. Jun 76, 15p Rept no. SRI-JSR-74-5
Contract DAHC15-73-C-0370, ARPA Order-2504

Descriptors: *Ionospheric chemistry, *Cesium, *D region, Cloud cover, Seeding, Chemical reactions, Sunlight, Ionization, Electron density, Day, Night sky, Ionospheric propagation, Very high frequency, High frequency, Ionospheric disturbances, Communication and radio systems, Long range(Distance).
Identifiers: Ionosphere, Chemical release studies.

If 1000 kg (7500 moles) of cesium were deposited over a 10-km height interval centered about 80-km altitude, the cloud would spread within 1/4 hour to a 50-km radius, leaving a mean density of (Cs) = 6 x 10 to the 7th power/cc. Chemical reactions with oxygen would consume about 25% of the cesium, but most of it would remain in atomic form. Solar ionization is very effective, and Cs(+) will not transfer its charge to atmospheric constituents, which leads to nearly 100% ionization of the free Cs and to free-electron densities of nearly 3 x 10 to the 7th power/cc in less than an hour after a daytime release. Although the ionization will decrease rapidly at night, it will reappear again at sunrise, with electron densities of the order of 100,000/cc persisting for days. Disturbed radio propagation in VHF, and especially HF, would be present for days, possibly over distances up to several thousand kilometers. Seeding the D region with substantial quantities of cesium would provide a valuable diagnostic tool for investigation of the local atmospheric dynamics, but it could also produre undesirable effects on normal radio communications.

AD-A029 348/0GA PC$3.50/MF$3.00
Regis Coll Weston Mass
Comparison of Predicted Monthly Medians of Total Electron Content With Field Observations,
Florence A. Mulkern. 30 Jun 76, 24p Scientific-2, AFGL-TR-76-0158
Contract F19628-75-C-0081

Descriptors: *Ionospheric models, *Charge density, *Ionospheric propagation, Slant range, Radar tracking, Range finding, Errors, Accuracy, Solar disturbances, Ionospheric disturbances, F region, Ultrahigh frequency, Line of Sight.
Identifiers: Lunar variations, Ionosphere, Electron density.

The Bent model predicts total electron content along a slant path through the ionosphere, hence can be used to estimate range error for radars tracking satellites. The systematic bias generated by the model is estimated by comparing predicted median content with field measurements made during the last maximum of solar activity. Generally the bias is small compared to the r.m.s. deviation from the median of monthly observations. During equinoxes the model has significant bias which is traced to the specification of the thickness of the F region. (Author)

AD-A029 351/4GA PC$5.00/MF$3.00
Banaras Hindu Univ Varanasi (India) Inst of Tech
Natural Generation of Electromagnetic Waves and Interactions with Media. Part 2.
Final scientific rept.,
Rama Nohar Singh. Oct 74, 94p AFGL-TR-76-0147
Grant EOOAR-70-0070
See also Rept. no. AFCRL-TR-73-0093 dated Oct 72, AD-757 901.

Descriptors: *Bremsstrahlung, X rays, *Atmospherics, *Magnetosphere, *Whistlers, *Electromagnetic wave propagation, Plasmas(Physics), Polarization, Ionosphere, Electric fields, Geomagnetism, Monte Carlo method, Electron flux, Refractive index.
Identifiers: Sauter formula, Elwert Haug formula, India.

Existing formulae for bremsstrahlung cross-sections for charged particles precipitating into the lower ionosphere at high latitudes have been corrected to include the dependence on angle in the photo-ionization by bremsstrahlung photons. The study of polarization of bremsstrahlung X-rays in the lower ionosphere disclosed that the polarization parameters vary with height and are energy dependent so that precision measurement of X-ray polarization could be used for diagnostic purposes. It was found that the effect of an electric field along field lines on whistler-mode waves results in unducting of the wave. For processes in the equatorial electrojet it was concluded that the two-stream instability criteria is not satisfied during the westward current flow and magnetic-field depressions are correlated with the disappearance of equatorial sporadic-E traces

on ionograms. A secondary peak in intensity distribution of synchrotron radiation from a weakly-relativistic electron plasma is interpreted as being due to scattering of radiation by plasma inhomogeneities. (Author)

AD-A029 439/7GA PC$4.50/MF$3.00
Analysis and Computer Systems Inc Burlington Mass
Analytical and Processing Techniques for Rocket and Searchlight Probe Data which Bear upon Number Density Computation, Aerosol Scattering, and Optical Emissions.
Interim rept.,
Allan G. Cronin, Harold L. Dolan, III, and Peter W. Lindstrom. Apr 76, 67p Scientific-2, AFGL-TR-76-0092
Contract F19628-74-C-0169

Descriptors: *Upper atmosphere, *Atmospheric density, *Data processing, Atmospheric sounding, Electron density, Aerosols, Optical properties, Atmosphere models, Oxygen, Nitrogen, Far ultraviolet radiation, Absorption spectra, Mathematical models.
Identifiers: Atmospheric attenuation.

This report describes a number of numerical and processing procedures that were developed to aid Air Force Geophysics Laboratory (AFGL) researchers in the analysis and interpretation of experimental data. The research areas for which these techniques were developed include: The determination of number densities of upper atmospheric constituents, the study of atmospheric aerosol properties, and the study of atmospheric optical emissions.

AD-A029 499/1GA PC$3.50/MF$3.00
Brown Univ Providence R I Dept of Engineering
Energy Integral Description of the Development of Kelvin-Helmholtz Billows.
Technical rept.,
J. T. C. Liu, and L. Merkine. 27 May 75, 20p
Contract N00014-76-C-0363
Availability: Pub. in Tellus, v28 n3 p197-214 1976.

Descriptors: *Clear air turbulence, *Internal waves, *Ocean currents, Shear properties, Stratification, Reprints.
Identifiers: Kelvin-Helmholtz instabilities, Flow instability, Ocean microstructure.

In this paper the authors study the development of instability waves in a stratified shear flow which occurs, for instance, in frontal zones and on large scale internal waves where the Richardson number is sufficiently low. The model is based on splitting the flow into the mean flow and instability wave components. The basis for the interaction between the mean flow and the wave is their respective vertically integrated energy flux equations. The wave description is obtained through a shape assumption: the time dependent wave amplitude is determined by its energy equation solved jointly with the mean flow and the vertical shape function is given by the local linear theory. The instability wave kinetic energy development is determined by the balance between energy production from the mean flow and the conversion of fluctuation kinetic to potential energy. From the energy integral considerations, the numerical results show moderately good agreement with observations in our estimate of the lifetime of the wave and the doubling of the thickness of the mean shear layer during this time. The modification of the mean flow velocity and temperature profiles is explained via the effects of the wave generated vertical momentum and heat (or buoyancy) fluxes, respectively. (Author)

PAT-APPL-642 926/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Electrical Field Sensing and Transmitting Apparatus.
Patent Application,
William P. Winn, and L. G. Byerley, III. Filed 22 Dec 75, 17p AD-D002 870/4
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Meteorological instruments, *Balloonsondes, *Atmospheric electricity, Telemeter systems, Telemetering data, Electric fields, Thunderstorms, Cumulonimbus clouds.
Identifiers: *Patent applications, PAT-CL-324-2.

The patent application relates to a pair of conductive spherical shells carried by a balloon or other means into an electrical field which induces equal and opposite charges on the shells. Rotation of the shells causes the charges to alternate. The alternating sinusoidal charge is applied to an amplifier and the amplified output modulated and applied to a transmitter. The spherical shells become a telemetry antenna for transmitting the sensed electrical field information to a remote receiver.

PB-247 916-55/GA MF$3.00
World Data Center A for Solar-Terrestrial Physics, Boulder, Colo.
Equivalent Ionospheric Current Representations by a New Method, Illustrated for 8-9 November 1969 Magnetic Disturbances,
Y. Kamide, H. W. Kroehl, M. Kanamitsu, J. H. Allen, and S. I. Akasofu. Apr 76, 99p UAG-55, NOAA-76051901
Grant NSF-DES74-23832
Prepared in cooperation with Cooperative Inst. for Research in Environmental Science, Boulder, Colo., Alaska Univ., College. Geophysical Inst., and National Center for Atmospheric Research, Boulder, Colo.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $25.20/year, single copy $1.60 this issue.

Descriptors: *Atmospheric disturbances, *Magnetic storms, Weather, Ionosphere, Mathematical models, Atmospheric models, Graphs(Charts).

This report illustrates a data set of worldwide potential contours for ground magnetic perturbations resulting from a new method described by Kamide et al. (1976). It contains brief comments on other methods of representing magnetic activity and a discussion of the new method. Plots at 10-minute intervals of magnetic perturbation vectors from 82 northern hemisphere observatories and the corresponding potential contours are presented. Also given are AU and AL index graphs for the 36-hour interval from 1200 UT November 8 to 2400 UT November 9, 1969. Appendices describe in detail the procedures used to determine a potential field from ground magnetic perturbations.

PB-247 916-56/GA MF$3.00
World Data Center A for Solar-Terrestrial Physics, Boulder, Colo.
Iso-Intensity Contours of Ground Magnetic H Perturbations for the December 16-18, 1971 Geomagnetic Storm,
Y. Kamide. Apr 76, 45p UAG-56, NOAA-76051902
Grant NSF-DES74-23832
Prepared in cooperation with Alaska Univ., College. Geophysical Inst., and Cooperative Inst. for Research in Environmental Science, Boulder, Colo.
Paper copy available from National Climatic Center, Attn: Publications, Federal Bldg., Asheville, N.C. 28801. Subscription $25.20/year, single copy $0.70 this issue.

Descriptors: *Magnetic storms, *Atmospheric disturbances, Meteorological charts, Meteorological data, Weather observations, Spaceborne photography.

This report provides data of the geomagnetic storm which occurred between December 16-18 of 1971. Included are 720 contour maps which cover the entire period of the storm at 5-minute intervals.

PB-257 375/6GA PC$5.50/MF$3.00
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
Radiation Data Reduction Procedures for Sabreliner, C-130, and DC-6 Aircraft During the GARP Atlantic Tropical Experiment,
Stephen K. Cox, and Bruce A. Albrecht. Feb 76, 110p AS-Paper-244, NOAA-76060205
Grant NSF-OCD74-21678

Descriptors: *Radiation measuring instruments, *Radiometers, *Atmospheric radiation, Radiometry, Tropical atmospheres, Research aircraft, Earth atmosphere, Data processing, Data reduction.
Identifiers: GARP Atlantic Tropical Project.

This report presents a description of the basic radiation data gathering systems used on three U.S. Aircraft during the GARP Atlantic Tropical Experiment. In addition to an explanation of the hardware used, the data reduction procedures applied to the raw data are given in detail. Significant problems encountered in the data are also discussed.

PB-257 376/4GA PC$4.00/MF$3.00
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
A Stellar Scintillometer for Measurement of Refractive-Turbulence Profiles.
Technical memo.,
G. R. Ochs, Ting-i Wang, and F. Merrem. Apr 76, 26p NOAA-TM-ERL-WPL-15
Contract F30602-74-0108

Descriptors: *Extraterrestrial atmospheres, *Optical measuring instruments, Atmospheric attenuation, Light transmission, Optical detectors, Refractive index, Remote sensing, Computer programs, BASIC programming language.
Identifiers: *Atmospheric transmissivity, Optical spatial filters, *Stellar scintillometers.

An optical system for measuring refractive-turbulence profiles in the atmosphere is described. The instrument measures the profile along the light path to a star by analyzing the scintillation of the star by the atmosphere. The circuit diagram, computer program, and operating instructions for the instrument are included.

4B. Meteorology

AD-A029 140/1GA PC$5.50/MF$3.00
Commonwealth Weather Corp Norfolk Va
Reading 500 Millibar Flow Patterns in Relation to Surface Weather Developments with Special Emphasis on Forecasting for the Mediterranean and Adjoining Areas.
Final rept.,
Hermann B. Wobus, James E. Smith, and James C. McLean, Jr. Jul 76, 122p
Contract N00014-75-C-1061

Descriptors: *Marine meteorology, *Weather forecasting, *Mediterranean Sea, *North Atlantic Ocean, Synoptic meteorology, Patterns, Meteorological phenomena, Atmospheric disturbances, Surface roughness, Air water interactions, Western Europe.

This is a synoptic presentation using qualitative trajectory and/or airstream analysis at the 500

millibar level as a means of interpreting the sequence of events associated with pattern transition and inter-system disturbance at the synoptic scale. Emphasis is given to application in the area of western Europe, the Mediterranean, and adjoining portions of the Atlantic Ocean.

AD-A029 147/6GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813A Lance Missile Number 2163, Round Number 274 ECL.
Meteorological data rept.
Mar 76, 39p Rept no. DR-908

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Data reduction, Surface to surface missiles, Launching, Ballistics.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12813A Lance, Missile Number 2163, Round Number 274 ECL, are presented in tabular form. (Author)

AD-A029 148/4GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813A Lance Missile Number 2240, Round Number 275 ECL.
Meteorological data rept.
Mar 76, 37p Rept no. DR-909

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Data reduction, Surface to surface missiles, Launching, Ballistics.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12813A Lance, Missile Number 2240, Round Number 275 ECL, are presented in tabular form. (Author)

AD-A029 149/2GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12814B Lance Missile Number 2711, Round Number 277 AST,
Meteorological data rept.
Apr 76, 34p Rept no. DR-911

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Data reduction, Surface to surface missiles, Launching, Ballistics.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12814B Lance, Missile Number 2711, Round Number 277 AST, are presented in tabular form. (Author)

AD-A029 150/0GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12815 Lance Missile Number 3667, Round Number 278 RSL.
Meteorological data rept.
Apr 76, 39p Rept no. DR-912

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Data reduction, Surface to surface missiles, Launching, Ballistics.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12815 Lance, Missile Number 3667, Round Number 278 RSL, are presented in tabular form. (Author)

AD-A029 151/8GA PC$3.50/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
17901 Honest John Missile Number 1452, Round Number 651 ASL.
Meteorological data rept.
May 76, 18p Rept no. DR-913

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Data reduction, Artillery rockets, Launching, Ballistics.
Identifiers: Honest john.

Meteorological data gathered for the launching of 17901 Honest John, Missile Number 1452, Round Number 651 ASL, are presented in tabular form. (Author)

AD-A029 152/6GA PC$3.50/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
17901 Honest John Missile Number 1475, Round Number 652 ASL.
Meteorological data rept.
May 76, 18p Rept no. DR-914

Descriptors: *Meteorological data, *Upper atmosphere, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(Data), New Mexico, Guided missile ranges, Wind direction, Altitude, Data reduction, Artillery rockets, Surface launching, Ballistics.
Identifiers: Honest john.

Meteorological data gathered for the launching of 17901 Honest John, Missile Number 1475, Round Number 652 ASL, are presented in tabular form. (Author)

AD-A029 153/4GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
17901 Honest John Missile Number 1474, Round Number 653 ASL (21 May 1976).
Meteorological data rept.
May 76, 26p Rept no. DR-915

Descriptors: *Meteorological data, *Upper atmosphere, Wind direction, Atmospheric temperature, Barometric pressure, Humidity, Atmospheric density, Dew point, Wind velocity, Cloud cover, Refractive index, Tables(data), New Mexico, Guided Missile Ranges, Data reduction, Artillery rockets, Launching, Ballistics.
Identifiers: Honest john.

Meteorological data gathered for the launching of 17901 Honest John, Missile Number 1474, Round Number 653 ASL, are presented in tabular form. (Author)

AD-A029 154/2GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813A Lance Missile Number 2160, Round Number 276 ECL.
Meteorological data rept.
Apr 76, 34p Rept no. DR-910

Descriptors: *Meteorological data, *Upper atmosphere, Meteorological balloons, Altitude, Tables(Data), Data reduction, Atmospheric temperature, Barometric pressure, Wind direction, Wind velocity, Cloud cover, Atmospheric density, Refractive index, Surface to surface missiles, Surface launching, Guided missile ranges.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12813A Lance, Missile Number 2160, Round Number 276 ECL, are presented in tabular form. (Author)

AD-A029 156/7GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813A Lance Missile Number 3075, Round Number 279 ACL (9 July 1976).
Meteorological data rept.
Jul 76, 26p Rept no. DR-917
Availability: Microfiche copies only.

Descriptors: *Meteorological data, *Upper atmosphere, Meteorological balloons, Altitude, Data reduction, Tables(Data), Atmospheric temperature, Barometric pressure, Wind direction, Wind velocity, Cloud cover, Atmospheric density, Refractive index, Surface to surface missiles, Guided missile ranges, Surface launching.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12813A Lance, Missile Number 3075, Round Number 279 ACL, are presented in tabular form. (Author)

AD-A029 157/5GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12818 Lance Missile Number 2211, Round Number 280 RML (13 July 1976).
Meteorological data rept.
Jul 76, 39p Rept no. DR-918
Availability: Microfiche copies only.

Descriptors: *Meteorological data, *Upper atmosphere, Meteorological balloons, Tables(Data), Atmospheric temperature, Altitude, Wind direction, Wind velocity, Barometric pressure, Refractive index, Atmospheric density, Cloud cover, Surface to surface missiles, Surface launching, Guided missile ranges, Data reduction.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12818 Lance, Missile Number 2211, Round Number 280 RML, are presented in tabular form. (Author)

AD-A029 158/3GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14814 Lance Missile Number 3203, Round Number 281 APT (15 July 1976).
Meteorological data rept.
Jul 76, 38p Rept no. DR-919
Availability: Microfiche copies only.

Descriptors: *Meteorological data, *Upper atmosphere, Meteorological balloons, Tables(Data), Altitude, Atmospheric temperature, Barometric pressure, Wind direction, Wind velocity, Cloud cover, Atmospheric density, Refractive index, Data reduction, Guided missile ranges, Surface to surface missiles, Surface launching.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 14814 Lance, Missile Number 3203, Round

Number 281 APT, are presented in tabular form. (Author)

AD-A029 159/1GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12814 Lance Missile Number 3796, Round Number 282 RPT (15 July 1976).
Meteorological data rept.
Jul 76, 34p Rept no. DR-920
Availability: Microfiche copies only.

Descriptors: *Meteorological data, *Upper atmosphere, Meteorological balloons, Data reduction, Tables(Data), Altitude, Atmospheric temperature, Wind direction, Wind velocity, Surface to surface missiles, Guided missile ranges, Surface launching, Cloud cover, Atmospheric density, Refractive index, Barometric pressure.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 12814 Lance, Missile Number 3796, Round Number 282 RPT, are presented in tabular form. (Author)

AD-A029 160/9GA PC$4.00/MF$3.00
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14811A Lance Missile Number 3205, Round Number 283 APT (22 July 1976).
Meteorological data rept.
Jul 76, 35p Rept no. DR-921
Availability: Microfiche copies only.

Descriptors: *Meteorological data, *Upper atmosphere, Altitude, Meteorological balloons, Data reduction, Tables(Data), Atmospheric temperature, Barometric pressure, Wind direction, Wind velocity, Cloud cover, Atmospheric density, Refractive index, Surface to surface missiles, Surface launching, Guided missile ranges.
Identifiers: Lance missiles.

Meteorological data gathered for the launching of 14811A Lance, Missile Number 3205, Round Number 283 APT, are presented in tabular form. (Author)

AD-A029 354/8GA PC$4.00/MF$3.00
Air Force Geophysics Lab Hanscom AFB Mass
A Climatology of Selected Storms for Wallops Island, Virginia, 1971-1975 AFGL/SAMS Report Number 4.
Environmental research papers,
Robert O. Berthel. 2 Jun 76, 34p Rept nos.
AFGL-ERP-563, AFGL-TR-76-0118

Descriptors: *Storms, *Meteorological data, Virginia, Wind velocity, Wind direction, Hydrometeors, Climate, Moisture content, Winter, Atmospheric temperature, Cloud cover, Atmospheric precipitation, Meteorological radar, Reflectivity, Statistical analysis.
Identifiers: *Wallops Island(Virginia).

The SAMS hydrometeor erosion tests, held during the winter storm seasons of 1971 through 1975, have yielded considerable meteorological data concerning the weather situations that were prevalent at the time of each test. The situations have been categorized into three different types and the data under each category have been statistically analyzed to produce the mean values and corresponding standard deviations of many meteorological parameters. The data are presented in both tables and graphs for each category, plus wind speed direction up to 12 km in altitude for all situations. A general description of storm structure is given defining regions of precipitation and zones of transition. An appendix of general climatic data for Wallops Island, Virginia is included. (Author)

AD-A029 438/9GA PC$6.75/MF$3.00
Washington Univ Seattle Cloud Physics Group
Dynamical and Microphysical Structures of Cyclonic Storms in the Pacific Northwest (The CYCLES Project).
Final rept. 1 Oct 73-30 Apr 76,
Peter V. Hobbs, Robert A. Houze, Jr., John D. Locatelli, Paul H. Herzegh, and Donald G. Atkinson. 23 Apr 76, 173p Cloud physics research-11, AFGL-TR-76-0010
Contract F19628-74-C-0066

Descriptors: *Storms, *Tropical cyclones, *Rainfall, Microstructure, Cloud physics, Particles, Cirrus clouds, Ice, Meteorological radar, Airborne, Atmospheric precipitation, Convection(Atmospheric), Ice formation, Atmospheric circulation, Synoptic meteorology, Fronts(Meteorology), Stratus clouds, Washington(State).
Identifiers: *Pacific Northwest Region(United States), Extratropical storms.

Contents:
Mesoscale rainbands;
Dynamics and cloud microphysics of the rainbands in an occluded frontal system. Case 1:
December 19-21, 1973;
Dynamics and cloud microphysics associated with an occluded frontal system. Case 2:
January 16, 1975;
Dynamics and microphysics of stratiform clouds associated with frontal systems;
Airborne measurements and observations in cirrus clouds.

PB-253 271-04/GA PC$5.00
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
Environmental Satellite Imagery. April 1976.
Apr 76, 97p KMRD-5.4-7604, NOAA-76070102
Key to Meteorological Records Documentation.

Descriptors: *Cloud cover, *Spaceborne photography, Indexes(Documentation), Aerial photographs, Meteorological satellites.
Identifiers: NOAA-2 satellite, NOAA satellites.

The publication provides a description of current cloud data obtained by NOAA's operational environmental satellite. It contains daily global satellite imagery in condensed form as a guide to data stored in the NOAA archive, and is designed to assist users in selecting data for research and climatological use.

PB-257 062/0GA PC$4.50/MF$3.00
Illinois State Water Survey, Urbana.
Hydrometeorology of Heavy Rainstorms in Chicago and Northeastern Illinois. Phase I. Historical Studies.
Rept. of investigation,
Floyd A. Huff, and John L. Vogel. 1976, 69p
ISWS/RI-82/76, W76-11875
Grant NSF-ENV76-01447

Descriptors: *Rainfall intensity, *Storms, *Urban areas, *Hydrometeorology, Storm sewers, Precipitation(Meteorology), Climatology, Floods, Runoff, Hydraulic structures, Spatial distribution, Design, Illinois, Metropolitan areas.
Identifiers: *Urban hydrology, *Chicago(Illinois), *Northeast Region(Illinois).

The report presents the results of an investigation of heavy rainstorms in the Chicago urban area and the surrounding six counties, based on available historical data of rainfall and associated weather conditions. The counties are Cook, Du Page, Kane, Will, Lake, and McHenry. Frequency distributions of point rainfall are presented for rain periods from 5 minutes to 72 hours and recurrence intervals of 6 months to 50 years. Also presented are the relationship between point and areal mean rainfall frequencies, time and space distribution characteristics of heavy rains, orientation and movement of storms, the frequency distribution of storm centers, synoptic weather conditions associated with severe rainstorms, and the diurnal, monthly, and seasonal distribution of flood-producing storms. Results of this investigation are particularly useful in hydrologic design problems, such as in the design of urban storm sewer systems, but have application also in agriculture, environmental problems, and various phases of climatology and hydrometerology.

PB-257 254/3GA PC$4.00/MF$3.00
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
A Preliminary Estimate of a Tropical Cyclone Track Change Caused by Artificial Enhancement of Convective Heat Release.
Technical memo.,
Robert W. Jones. Apr 76, 29p NOAA-TM-ERL-WMPO-27, NOAA-76060404

Descriptors: *Tropical cyclones, *Heat transfer, *Weather modification, Atmospheric models, Three dimensional flow, Mathematical models, Hurricane tracking, Convection, Vortices, Atmospheric circulation, Storms, Estimating, Friction, Drag.
Identifiers: Convection(Atmospheric).

The response of a three-level, three-dimensional model of a tropical cyclone to artificial enhancement of the convective heating rate, such as may occur by man's efforts to modify a hurricane, is examined. Results with symmetric and asymmetric distributions of enhanced convection show that the principal short-term (up to 21 hours after the enhancement begins) effect of the enhancement upon the track of the vortex is to induce a trochoidal oscillation about the mean path of the control experiment. The planetary, or beta-effect, is not yet included in the model, but this influence upon possible track changes due to enhanced convection is discussed.

PB-257 256/8GA PC$4.00/MF$3.00
National Oceanic and Atmospheric Administration, Boulder, Colo. Marine Ecosystems Analysis Program Office.
An Assessment of the Meteorological Stations Along the Strait of Juan de Fuca.
Technical memo.
May 76, 38p NOAA-TM-ERL-MESA-12, NOAA-76061507

Descriptors: *Weather stations, *Wind(Meteorology), *Juan de Fuca Strait, *Ecology, Seasonal variations, Oil pollution, Weather observations, Meteorological instruments, Air water interactions, Marine meteorology, Assessments, Puget Sound, Canada, Washington(State).
Identifiers: Oil spills, Ecosystems.

The paper represents the first effort of the Puget Sound Energy-Related Research Project's wind study. It attempts to (1) provide a brief overlook of the seasonal wind flow within the area, (2) describe and analyze the permanent meteorological networks (both U.S. and Canadian), and (3) summarize initial project field activities undertaken to improve the understanding of the winds within the Strait of Juan de Fuca and northern Puget Sound.

PB-257 367/3GA PC$3.50/MF$3.00
National Oceanic and Atmospheric Administration, Washington, D.C. Center for Experiment Design and Data Analysis.
Thermal Time Constants of U.S. Radiosonde Sensors Used in GATE.
Technical memo.,

Scott L. Williams, and Donald T. Acheson. May 76, 21p NOAA-TM-EDS-CEDDA-7, NOAA-76061410

Descriptors: *Radiosondes, *Weather observations, *Temperature measuring instruments, *Thermistors, Atmospheric temperature, Mathematical analysis.
Identifiers: *Global Atlantic Tropical Experiment, *Hygristors.

Equations for computing thermal time constants of U.S. radiosonde sensors used in the GARP Atlantic Tropical Experiment (GATE) are developed.

PB-257 368/1GA PC$4.00/MF$3.00
National Oceanic and Atmospheric Administration, Silver Spring, Md. Air Resources Labs.
Climatology of Stagnating Anticyclones East of the Rocky Mountains, 1936-1975.
Technical memo.,
Julius Korshover. Mar 76, 30p NOAA-TM-ERL-ARL-55, NOAA-76061506

Descriptors: *Anticyclones, *Air pollution, *Climatology, *Meteorological data, Statistical data, Weather forecasting, Seasonal variations, Atmospheric disturbances, Storms, Atmospheric pressure, Pressure gradients, Periodic variations, Autumn, Rocky Mountains, United States.
Identifiers: Eastern Region(United States).

Stagnating anticyclones are often associated with incidents of heavy air pollution in urban areas. A 40-year climatology is presented to delineate occurrences of stagnating anticyclones in the eastern United States. Occurrences of stagnation are determined on the basis of pressure-gradient values considered with other meteorological factors. Affected areas are depicted on maps by use of a system of grid points. Data showing cases of stagnation (i.e., episodes) are shown on both an annual and seasonal basis. These data indicate that stagnation is most likely in autumn. The total number of stagnation days for the 40-year period is also shown.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A029 253/2GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The DSARC Process: A Mid-Term Report Card.
Student study rept.,
Aubrey J. Lynch. Nov 74, 60p
Report on Program Management Course.

Descriptors: *Management engineering, *Department of Defense, *Procurement, Decentralization, Policies, Surveys, Weapon systems, Project personnel, Assessment.
Identifiers: Defense systems acquisition review council, Program management.

This study takes a look at the DSARC process as it is functioning in today's environment. It begins by investigating the historical base that caused Mr. Packard to establish the Defense Systems Acquisition Review Council (DSARC) and describes its purpose. The study then evaluates the impact the present DSARC is having on three unidentified but typical major weapon systems that are currently undergoing DSARC review. The conclusions drawn from the study are that the present method of operation of the DSARC is weakening the program manager's authority and that the DSARC process is recentralizing authority for program decisions back into DOD.

AD-A029 256/5GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Influence of Management Style on Effective Communication in the Program Management Environment.
Student study rept.,
Thomas Francis Kennedy. Nov 74, 32p
Report on Program Management Course.

Descriptors: *Management engineering, *Social communication, *Interpersonal relations, *Behavioral science, Reviews, Methodology, Effectiveness, Decision making, Information sciences, Organization theory.
Identifiers: Program management, Management style, Technique development.

The influence that managerial style has on communication in the program management environment was assessed. A literature search was conducted followed by an analysis of pertinent data. The Managerial Grid of Blake and Mouton was coupled with the Johari Awareness Model of Luft and Ingham to provide a conceptual framework for assessing the myriad of managerial styles. The effect various styles have on communication was then analyzed. Consequently, any program manager can be administered the Styles of Management Inventory Test of Teleometrics International and use the results in connection with this report to assess the communications impact on his program office.

AD-A029 257/3GA PC$3.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Impact of the Congressional Budget and Impoundment Control Act of 1974 (PL93-344) on the Program Management Office.
Student study rept.,
Robert Wencel Wilda. Nov 74, 23p
Report on Program Management Course.

Descriptors: *Federal budgets, *Legislation, *Management planning and control, Planning programming budgeting, Methodology, Modification, Estimates, Scheduling, Accuracy, Department of Defense, Requirements, Impact.
Identifiers: Appropriations, Program management, Congressional Budget and Impoundment Control Act of 1974.

The Congressional Budget and Impoundment Control Act of 1974 contains provisions which will significantly change the Federal Budget process. These changes will be felt in the DOD planning, programming, and budgeting system, and in turn at the Program Management Office. This study identifies and analyzes relevant sections of the Act as relating to the PMO. The significant findings of the study are that the PMO will have to submit budget estimates much earlier than has been required up to now and budget submissions will have to be more accurate. Planning and estimating will be of great importance, and PMO flexibility will decrease as a result of provisions of the Act.

AD-A029 272/2GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Contract Data Management.
Student study rept.,
Ronald J. Duddleston. May 76, 51p
Report on Program Management Course.

Descriptors: *Contract administration, *Data management, *Department of Defense, Policies, Naval planning, Management planning and control, Effectiveness.
Identifiers: Program management, Managers.

It is the purpose of this paper to provide an overview of the discipline of contract data management and in particular the implementation of DOD data management policies within the NAVAL SEA SYSTEMS COMMAND and its Project Offices. To the end of trying to provide in a single paper that information required by a Program Manager to become sufficiently conversant in the discipline of data management to effectively and efficiently manage his program, this paper has been prepared.

AD-A029 273/0GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Management Information System for the U. S. Army Satellite Communications Agency.
Student study rept.,
Edwin L. Cross. May 76, 44p
Report on Program Management Course.

Descriptors: *Information systems, *Computer applications, *Management information systems, Satellite communications, Army planning, Data processing, Systems engineering, Project personnel, Decision making, Reviews, Problem solving, Costs, Military organizations.
Identifiers: Program management.

This report describes the potential benefits which would accrue from a central computerized Management Information System (MIS) installed at the U.S. Army Satellite Communications Agency, and how such a system might be developed.

AD-A029 278/9GA PC$4.00/MF$3.00
Army Procurement Research Office Fort Lee Va
Methodology for Evaluating and Negotiating Independent Research and Development and Bid and Proposal Costs.
Final rept.,
Frederick W. Helwig, and C. Eugene Beeckler. Jul 76, 26p Rept no. APRO-610-F

Descriptors: *Contracts, *Negotiations, Cost analysis, Proposals, Assessment, Military procurement, Army, Navy, Air Force, Supply depots.

There is only limited guidance on how to evaluate independent research and development (IR and D) and bid and proposal (B and P) costs for those contractors that require the negotiation of advance agreements. With only limited guidelines for determining the equitability or creditability of such costs, it is exceedingly difficult to evaluate and negotiate appropriate costs. The development of simple, equitable and creditable methods or techniques in the evaluation and negotiation of advance agreements for IR and D and B and P is the objective of this report. Current methods and techniques of evaluating and negotiating IR and D and B and P costs were evaluated. Personnel of the three Military Services and the Defense Supply Agency (DSA) involved with IR and D and B and P negotiations were interviewed. Also, previous research studies and GAO reports on the subject were reviewed.

AD-A029 323/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Problem Solving for Managers.
Study project rept.,
James W. Filson. May 76, 28p

Descriptors: *Problem solving, *Decision making, *Decision theory, *Management planning and control, *Systems management, Costs, Skills, Sequences, Role playing.
Identifiers: Concepts, Management training.

The purpose of this paper is to describe a technique for problem solving by managers. Although problem solving is widely discussed in management literature, it is normally approached as a general theory that does little to help the working manager solve the problems

that confront him daily. The technique described in this paper provides a step-by-step means to assist the manager identify the real, underlying problem, not just the symptom. It then provides a guide for the manager to use to solve the problem after he has accurately identified it. Also included in the paper are examples of role play exercises that are effective training vehicles for teaching this technique of problem solving. (Author)

AD-A029 327/4GA PC$3.50/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Graduate School of Industrial Administration
Toward a Framework of Organizational Effectiveness.
Technical rept.,
Paul Goodman, and Johannes Pennings. 8 Sep 76, 11p Rept no. TR-3
Contract N00014-75-C-0973

Descriptors: *Industrial plants, *Management planning and control, *Organization theory, *Training, Effectiveness, Workshops(Meetings), Management engineering, Survival(General), Universities, Industrial personnel, Problem solving.
Identifiers: *Industrial management, *Organizational effectiveness, *Industrial administration, Organizational goals, Organizational adaptability, Comparative organizational analysis, Orgainzational effectiveness indicators, Carnegie-Mellon University.

This report reviews five original essays on organizational effectiveness presented at a workshop on organizational effectiveness at Carnegie-Mellon University in June, 1976. (Author)

AD-A029 333/2GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Project Management by Functional Codes of a Navy Systems Command (NAVELEXSYSCOM).
Study project rept.,
Val J. Pietrasiewicz. May 76, 35p

Descriptors: *Project personnel, *Management, *Acquisition, *Planning, Life cycles, Naval equipment, Naval planning, Naval procurement, Contract administration, Naval logistics, Naval training, Maintainability, Reliability, Spare parts.

This report was written to ascertain what planning, control, and responsibility is nested in functional codes of a Navy Systems Command to provide the means for management of 'less-than-major' projects (as defined by DODD 5000.1) throughout their life cycle. Formal instructions and procedures were examined to determine if the Command's system was adequate to support a project's transition from advanced development (R and D) to engineering development (R and D) or production. Responsibility documents were located, but follow-on procedural instructions had not been written. Interviews with top management highlighted facts which lead to the realization that informal policies were responsible for the manner in which life-cycle project management was being conducted. Recommendations include a request for a formal instruction to institutionalize actions which are now being carried out informally. (Author)

AD-A029 401/7GA PC$4.50/MF$3.00
California Univ Berkeley Inst of Industrial Relations
Interpersonal, Work Group, and Organizational Communication: A Systemic Approach to Understanding Organizations.
Final rept.,
Karlene H. Roberts, and Charles A. O'Reilly. Aug 76, 58p Rept no. TR-13
Contract N00014-69-A-0200-1054

Descriptors: *Organizations, *Research management, *Social communication, *Decision making, Behavioral science, Networks, Social psychology, Performance.
Identifiers: *Organizational communication, Expertise, Work groups.

This final report of a research program supported by the Office of Naval Research discusses the various aspects of the research program and indicates where it stands to date. The report also indicates future research suggested by some of the findings, and mentions points of departure in this initial set of empirical investigations. Some possibilities for application of the results are mentioned. The report summarizes information from previous technical reports in an attempt to tie together the entire research program. Some data not reported elsewhere are presented as well. The overall intent of the research program was to assess organizations as social-psychological systems, using the general concept of communication as a unifying variable across individuals, their work groups, and the organizations in which these groups function. (Author)

AD-A029 419/9GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Program Manager's Role in Systems Analysis: Concept Formulation.
Study project rept.,
Melvin Anthony Nosal. Nov 74, 65p

Descriptors: *Management planning and control, *Systems analysis, *Weapon systems, *Concept formation, *Systems management, Cost analysis, Systems engineering, Missions, Contract administration.
Identifiers: Project management, *Program managers, Management tools.

Although DODD 5000.1 deemphasizes detailed paper design studies in favor of prototyping, there is a continuing need for well-conceived, explicit analysis during the concept formulation stages of a proposed program. It is by means of this analysis that an operational deficiency is translated into a requirement which is in turn transformed into the conceptual design for a new system. This report discusses the conceptual design analysis process in some detail and describes the decisions and responsibilities of a PM. The study describes in brief how various forms of analyses--contingency, sensitivity and others--may affect the conceptual design of a weapon system. The example concept formulation study plan illustrated in this report identifies the study tasks and their interrelationships in synthesizing a preliminary concept design. This type of synthesis is not normally visible in program management simulation exercises, such as the system X laboratory exercise which is part of the curriculum at the Defense Systems Management School. The study concludes that although many argue that the PM is too busy to serve as the advocate for his program and that this role of advocacy may not be explicit in his Program Charter, he has traditionally carried out this function and is expected to do so. If he is to perform in this role to the best of his ability, it is imperative that he be familiar with the analysis that underlies the design, performance parameters and cost of the weapon system being acquired under his management. (Author)

AD-A029 531/1GA PC$4.00/MF$3.00
Army Armament Command Rock Island Ill Cost Analysis Div
Application of Queueing Theory to the Review and Validation of Foreign Military Sales (FMS) Cases.
Technical rept.,
James F. Goodall. May 76, 31p Rept no. DRSAR-CPE-76-6

Descriptors: *Queueing theory, *Management, Operations research, Military procurement, Foreign aid, Military assistance, Military equipment, Mathematical models, Cost analysis.
Identifiers: *Waiting line problems, *Foreign military sales.

The application of queueing, or waiting-line, theory to the the review and validation of Foreign Military Sales (FMS) cases by the Cost Analysis office of an Army Materiel Development and Readiness Command major subordinate command is presented in this report. Queueing analysis is applied to determine the behavior characteristics of the processing system so that management can take appropriate action to reduce the total time in the system. The primary characteristics analyzed are the expected length of the queue, the expected number of cases in the system, the expected waiting time, and the expected turnaround time. Queueing theory is described, and the application to FMS cases presented, to also serve as an aid in the solution of similar types of waiting-line problems. (Author)

AD-A029 670/7GA PC$5.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
A case Study of the Combined Arms Combat Developments Activity, Cost Consideration in Decisionmaking Regarding Combat Development Studies.
Final rept.,
Ransford A. Reinhard. 11 Jun 76, 91p
Master's thesis.

Descriptors: *Army research, *Combat effectiveness, *Cost benefits, Army planning, Decision making, Contracts, Manpower utilization, Resources, Shortages, Military requirements, Determination, Military doctrine, Army budgets, Army personnel, Civilian personnel, Theses.
Identifiers: *Combined Arms Combat Development Activity.

This thesis addresses the problem of whether cost-benefit analysis would assist the manager in decisionmaking regarding combat developments studies within the Combined Arms Combat Developments Activity (CACDA) and develops a basis for improved decisionmaking techniques. The case study determined that CACDA is a professional and competent organization capable of developing recommendations, alternatives, or solutions to many critical problems facing the Army; however, this capability has been degraded because CACDA has been tasked to undertake more combat developments studies than it has the capability to conduct. As a result of this excessive work load, significant delays in the planned completion of studies were experienced, and the desired validation of other studies may not have been possible. This situation resulted because the present system and management tools do not provide sufficient criteria for identifying the more critical studies and reducing the scope or eliminating the others. The study concludes that: (1) CACDA managers need an analytical tool to assist them in decisionmaking and developing recommendations to higher headquarters regarding whether a study should be conducted as proposed, (2) managers consider costs in decisionmaking although costs are not as significant as other considerations, (3) managers can assign a relative value to a study proposal, (4) a form of cost-benefit analysis would provide a valuable analytical tool to assist the managers in developing recommendations pertaining to a study proposal. (Author)

HRP-0000691/6GA PC$4.00/MF$3.00
Stanford Univ., Calif. Graduate School of Business.
A Three-Stage Manpower Planning and Scheduling Model. A Service Sector Example.
Research paper,

William J. Abernathy, Nicholas Baloff, John C. Hershey, and Sten Wandel. Sep 72, 36p RR-101

Descriptors: *Health planning, *Health manpower, *Nurses, Hospital administration, Allocations, Medical personnel, Policies, Seasonal variations, Numerical analysis, Scheduling, Requirements, Personnel management, Tables(Data), Mathematical models.

A general numerical model is formulated by Stanford University Graduate Business School personnel for analysis of nurse staffing and scheduling policies; the mathematical aspects of the problem are discussed, and an example solution is given for a group of four wards in a hospital with a planning period of one month and seasonal variation of demand with a one year periodicity. To facilitate analysis the problem is broken down into three stages: policy decision, staff allocation for each planning period and short term scheduling within each planning period. An iterative method of solution is formulated and discussed but not solved, an a method employing linear programming for the staff allocation stage and a Monte Carlo method for the short-term scheduling is used to produce the sample solution.

HRP-0007508/3GA Not available NTIS
Planmetrics, Inc., Chicago, Ill.
Modeling Makes Budgeting More Efficient.
Fred S. Benson, and Michael A. Santullano. 1975, 3p
Pub. in Hospitals, Jnl. of the American Hospital Association v50 n1 p93-95 1 Jan 76.

Descriptors: Strategy, Project planning, Patients, Methodology, Inpatients, Health resources, Health planning, Health care, Health care facilities, Feasibility studies, Economics, Economic studies, Data processing systems, Acute care.

The use of computerized financial models to facilitate the hospital budgeting process is discussed. A push-pull situation is identified that often detracts from effective financial policy-making in hospitals. In the pull situation where medical excellence is brought to bear on policy-making, the impetus is usually insufficient understanding of the full financial impact on the organization. In the push situation, the financial planner is unable, due to lack of power, to inspire a higher degree of recognition for the importance of financial planning. It is noted that this push-pull effect must be reversed if administrators are to acquire the level of planning preparedness needed in an economic and technological environment. Although development of a cogent overall premise for financial policy planning for a group of largely autonomous departments can be accomplished through a system of financial models, it is noted that recognition, evaluation, and support must come from the top operating positions within hospital administration. It is further noted that on-line computer terminals will allow the financial staff of a hospital to consider in minutes the impact of different rate structures, pending government legislation, or wage negotiations. It is concluded that the practicality of computerized financial modeling in hospital administration is not at issue. The issue is rather the willingness of hospital administrators to meet the challenge presented by economic and governmental factors.

JPRS-67897 PC$4.00/MF$3.00
Joint Publications Research Service, Arlington, Va.
Calculating the Economic Effectiveness of Using Machines in Construction,
S. E. Kantorer. 3 Aug 76, 34p
Trans. of mono. Raschety Ekonomicheskoi Effektivnosti Primeneniya Mashin v Stroitelstve, Moscow, 1972 p53-71, 90-94.

Descriptors: *Construction management, *Machinery, *Economic analysis, Benefit cost analysis, Productivity, Computation, Efficiency, Cost effectiveness, Fixed investment, Management engineering, Construction equipment, Translations, USSR, Evaluation.

The report contains excerpts from a book on the method of determining productivity of construction machines. The excerpts consist of the procedural instructions and calculating formulas for determining cost and labor-consuming nature of a machine hour of construction machines and instructions and formulas for considering capital investments and cost of basic production funds in evaluating efficiency of mechanization.

PB-255 980/5GA PC$8.00/MF$3.00
Social Action Research Center, Berkeley, Calif.
Program Development: A Manual for Organizational Self-Study,
Judith Blanton, and Sam Alley. Aug 75, 230p
ADM/OPPE-72-143H, , ADAMA-72-4
Contract PHS-HSM-42-72-143

Descriptors: *Organizations, *Management engineering, *Project planning, *Manuals, Sequencing, Methodology, Human factors engineering, Services, Models, Development, Cycles, Feedback, Adaptive systems, Objectives, Organization theory, Personnel management, Purchasing, Scheduling, Revisions, Decision making.
Identifiers: Self study.

This manual was designed for organizations interested in self-development--in improving their planning, their use of resources, and learning from their successes and problems. It provides an example of a kind of situation one might face in attempting to implement that portion of the cycle and allows one to test his knowledge of the ideas presented in each chapter of the manual.

PB-256 307/0GA PC$5.00/MF$3.00
Moshman Associates, Inc., Bethesda, Md.
An Evaluation of Deficiencies in Program Study Designs.
Final rept.
2 Jul 75, 97p HRA/OA-75/8

Descriptors: Contracts, Evaluation, Design, Surveys, Interviews, Tables(Data), Projects, Recommendations.
Identifiers: *Health Resources Administration, Appendices.

A study dealing with the problem of reducing the time needed to obtain Office of Management and Budget (OMB) approval for surveys to collect data relating to Health Resources Administration (HRA) programs is reported. The major elements of the study are: (1) a documentation search for request clearances during 1974; (2) interviews with persons engaged in reviewing HRA requests for clearance; (3) a review of a sample of OMB-approved projects to determine if the collected data were responsive to the survey objectives; and (4) examinations of a sample of contracts signed by HRA to determine if they should have received clearance. The document search was undertaken to ascertain the defects in Requests for Clearance; interest was centered on the frequency of various defects and whether cited defects were remedied.

PB-256 309/6GA PC$6.75/MF$3.00
Abt Associates, Inc., Cambridge, Mass.
A Methodology for Studying Linkages for Health Manpower Education Planning and Decision Making.
Final rept.,
Nancy Lombardo, Diane Kell, Robert McMeekin, and Donald Muse. Nov 74, 163p AAI-74-116, BHRD/DMI-74/1
Contract N01-MB-4-4115

Descriptors: *Health manpower education, *Project planning, Linkages, Methodology, Health planning, Decision making, Allied health personnel, Surveys, Interviews, Objectives, Design, Recommendations, Tables(Data).
Identifiers: Appendices.

A conceptual framework for studying linkage development efforts is delineated and a methodology for studying State Linkage development efforts related to planning and decision-making for health manpower education is proposed. A series of field visits was made to New Jersey to study the linkage efforts involved in resource allocation for health manpower education. This was followed by telephone interviews with linkage projects in Hawaii, Minnesota, and Massachusetts. The results of these visits and interviews were discussed at a workshop which included discussions of the theoretical framework of the study, its goals and objectives, and decision-making processes. It was found that there are two types of problems with prevailing health manpower planning and decision-making processes; one area concerns technical inputs to decision-making and the other concerns the politics of decision-making.

PB-256 434/2GA PC$7.50/MF$3.00
National Research Council, Washington, D.C. Panel on Methodology for Statistical Priorities.
Setting Statistical Priorities.
1976, 180p ASPE-74-3
Grant DHEW-ASPE-007A-7404-P2021

Descriptors: *Statistical analysis, *Decision making, Data acquisition, Benefit cost analysis, User needs, Government policy, Requirements, Mathematical prediction, Surveys.

The Panel on Methodology for Statistical Priorities, Committee on National Statistics, National Academy of Science analysed and appraised the methods -- explicit and informal -- used in determining users needs for data, in assessing prospective benefits of statistical activities, and in establishing priorities among current and proposed statistics gathering activities. In order to provide focus to the study, primary emphasis was on the activities of the National Center for Education Statistics. Although some of the recommendations are specific to NCES, many of the components and principles are applicable to other statistical agencies as well. In addition, the need to place NCES within the perspective of the total educational statistics system was recognized.

PB-256 472/2GA Not available NTIS
International City Management Association, Washington, D.C. Management Information Service.
Zero-Base Budgeting in Garland, Texas.
Final rept.,
David L. Leininger, and Ronald C. Wong. Apr 76, 9p ICMA/18716/MIS-4A76/N
See also PB-256 473.
Pub. in Management Information Service, v8 n4A p1-6 Apr 76.

Descriptors: *Local government, *Budgeting, *Management methods, Decision making, Adaptive systems, Services, Technology innovation, Texas, Municipalities, Evaluation, Sequencing, Project planning, Specialized training.
Identifiers: *Planning programming budgeting, *Zero base budgeting, *Garland(Texas), Priorities, Program management, Management Information Service reports, Reprints.

Local governments are increasingly faced with fiscal pressures of unparalleled severity. Many local governments have already been forced to take steps which would have been unthinkable

only a few years ago. Others are looking for more rational management methods as at least a partial solution. One management approach attracting attention is zero-base budgeting, which offers a systematic way of exposing ongoing programs to the same intensive scrutiny normally reserved for new or expanded programs. It has already proven to be a powerful tool in both industry and government. This report describes how the city of Garland, Texas, designed and implemented zero-base budgeting. It is not a how-to-do-it report but offers some useful ideas in finding ways to improve the ability to cope with the present fiscal environment.

PB-256 573/7GA PC$6.00/MF$3.00
Tennessee Univ., Knoxville. Transportation Center.
Proceedings of the Conference on The Management of Large-Scale Interdisciplinary Research, Held at the University of Tennessee on October 14-17, 1975.
Jul 76, 147p* TC-76-019
Grant NSF-MN-44410

Descriptors: *Research management, *Organization theory, *Meetings, Universities, Businesses, Methodology, Problem solving, Project planning, Incentives, Policies, Performance evaluation.
Identifiers: Workshops(Meetings), Interdisciplinary research, Large scale projects.

In the past decade there has been increasing emphasis on interdisciplinary research in universities and other organizations engaging in research. Problems in society have become more complex and require many different approaches to problem solving. One finds that the number of disciplines needed to address an issue has greatly expanded. The importance of interdisciplinary research will clearly increase in the future. This conference focused upon the issues and problems related to the management of interdisciplinary research. The conference proceedings comprise both resource papers and proceedings from formal workshops.

PB-256 706/3GA PC$4.00/MF$3.00
Oregon Dept. of Human Resources, Salem.
The Development of a Management Information System for a Multi-Agency Department.
Special rept.,
William Duke Morton, and William R. Stow, III. 8 Jan 72, 41p 12-P-55297

Descriptors: *Information systems, *Data processing, *Social welfare, *Oregon, Criminology, Correction, Computer programming, State government, Monitoring, Computer programs, Management information systems.
Identifiers: IBM-360/40 computers, Correction departments(Criminology).

The paper, attached statements and contracts, has been written to clarify the proposed transfer of the PRIME/HELIX system to the Welfare Division's 360-40 computer, with especial reference to the Corrections Division.

PB-256 795/6GA PC$4.50/MF$3.00
McKinsey and Co., Inc., Washington, D.C.
A Summary of Recommendations for Strengthening the RANN Private Sector Productivity Program.
Jun 76, 52p NSF/RA-760039
Contract NSF-C1015
See also report dated Mar 76 PB-252 352.

Descriptors: *Productivity, *Research management, Objectives, Technology utilization, National government, Industries, Barriers, International trade, Economic analysis, Economic development.
Identifiers: RANN program.

This report summarizes the results of work done to assist the National Science Foundation (NSF) through its Research Applied to National Needs (RANN) program, in laying the groundwork for a strategy to guide its activities related to enhancing productivity improvement in the private sector. It also provides recommendations for near-term efforts that will move RANN in that strategic direction. The study's first phase concentrates on: (1) how business and government leaders view the nation's productivity problem and the Federal government's role in responding to that problem; (2) what strategic approach is required for the RANN program to carry out research in the area of private sector productivity improvement. The second phase focuses on the development of a specific approach, consisting of program thrusts and individual projects, for NSF/RANN to follow in carrying out research directed toward private sector productivity improvement. This report is a distillation of the entire study effort and includes a balance of views drawn from the research and from discussions with private sector industrial and business leaders, as well as government and university officials.

PB-256 865/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Product Safety and Product Performance Research at the National Bureau of Standards.
Final rept.,
John V. Fechter, Jr. 1976, 7p
Pub. in Proceedings of Congress of the International Ergonomics Association 'Old World, New World, One World' (6th), University of Maryland, College Park, Md., July 11-16, 1976, p136-140 1976.

Descriptors: *Product safety, *Consumer affairs, Standards, Performance tests, Quality control, Manufacturing, Human factors engineering, Technology, Research, Cooking devices, Stoves.
Identifiers: *Product performance, Ergonomics.

In 1974, the National Bureau of Standards established a Center for Consumer Product Technology to conduct product safety and product performance research. The Center's Human Factors Section operates a laboratory which is used for consumer product studies. While much of the Laboratory's equipment and instrumentation is fairly typical of other human factors laboratories, its configuration and application at NBS is unique. A study of cooking ranges is presented to illustrate how the facility is being used.

PB-257 066/1GA PC$5.50/MF$3.00
National Academy of Sciences, Washington, D.C. Board on Science and Technology for International Development.
Science and Technology Policy, Research Management and Planning in the Arab Republic of Egypt.
1976, 106p
Contract AID/csd-2584
Report of a Symposium on Science Policy Planning, Held at the National Research Centre, Cairo, April 30-May 1, 1975, and Workshop on the Management and Planning of Research, Held at the National Academy of Scientific Research and Technology, Cairo Egypt, May 3-8, 1975. Prepared in cooperation with Academy of Scientific Research and Technology, Cairo (Egypt).

Descriptors: *Technology transfer, *Meetings, Research management, Education, Manpower, Agreements, Cooperation, Universities, Egypt, United States.

In 1974, discussions among Egyptian and Americans on the role of science and technology in national development planning were begun both at governmental and private levels. Visits to the Arab Republic of Egypt (ARE) by members of the U.S. National Academy of Sciences and, independently, the creation of an intergovernmental U.S.-Egyptian Joint Working Group on Technology, Research, and Development, resulted in a decision to convene a conference on the management of scientific and technological research. The conference was to focus on science and technology policy, planning, and research management; a 'workshop' format was chosen as the best method to bring together a representative group of Egyptian and American physical, natural, and social scientists, economists, engineers, and development planners. The two-day symposium provided ample opportunity to contrast science and technology organization and planning in Egypt and the United States to trace the influences of national scientific and technological policies and programs on economic development, and to examine relationships between university teaching and research and national economic growth.

PB-257 076/0GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
Guidelines for the Determination and Development of Generic Safety Standards.
Final rept.,
Robert G. Hendrickson. Jun 76, 59p NBSIR-76-1096
Prepared for Consumer Product Safety Commission, Bethesda, Md.

Descriptors: *Product safety, *Consumer affairs, *Safety, Standards, Accident prevention, Hazards, Risk, Performance tests, Human factors engineering, Guidelines.

The guidelines were prepared to assist the Consumer Product Safety Commission in the development of generic safety standards. This development is based on conceptual models of product hazard interactions and analyses of accident sequences, product clustering, and hazard characteristics. The motivation for these guidelines derives from a perceived need to expedite the standard development process and to enhance the efficiency of standards for consumer product safety.

5B. Documentation and Information Technology

AD-A029 254/0GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Are Management Information Systems Really Used by Program Managers.
Student study rept.,
John J. Madison. Nov 74, 39p
Report on Program Management Course.

Descriptors: *Management information systems, Utilization, Project personnel, Decision making, Data acquisition, Information processing.
Identifiers: Managers.

The purpose of the study project was to determine if program managers in the Naval Air Systems Command used a management information system. The study examined the information flow that took place within the program manager's working environment; it identified the information the program manager used and how he acquired it; and finally a comparison was made between the procedures the program manager used to obtain and process the information he required with the functional elements of a formally defined Management Information System (MIS).

HRP-0005062/5GA Not available NTIS
Bureau of the Census, Washington, D.C.
Data Uses in the Private Sector. Proceedings of the Executive Seminar, Oct. 4, 1973.
Mar 74, 122p
Available from the Census Use Study Office, U.S. Bureau of the Census, Room 3540, Building 3, Washington, D.C. 20233, free.

Descriptors: Sources, Methodology, *Health care, Data, Data processing, Data processing systems, Data analysis, Availability.

Proceedings of a seminar on the application of data techniques in the private sector are presented. The one-day seminar, held concurrently with the Fifth DIME (Dual Independent Map Encoding) Workshop in October 1973 in Pacific Grove, California, was attended by 22 representatives of government, private research firms, and major California businesses. Speakers emphasized that DIME was not limited to data collection and planning uses in the public sector, but could also be used for market analysis, penetration studies, customer profiles, and economic surveys. The purpose of the seminar was to show the private sector what census tools are available, how to obtain them, and how to apply them in the decision-making process. Presentations include: The Making of a Decision; Geocoded Information Systems: Opportunities for Decision-making; How the Private Sector Uses Data and Technology; Trade Area Analysis Using the Coordinate MEDlist; Automated Carpooling; Further Applications for the Private Sector; DIME Technology in France; Applications in the Public and Private Sectors; and A Guide to the Products of the 1970 Census of Population and Housing. Data needs of local elected officials and local governments are discussed, and an explanation of the programs and prospects of the Census Use Study is provided. An overview of DIME is presented, together with a roster of seminar participants, a glossary, and a guide to Census Use Study availability and documentation.

HRP-0005432/0GA Not available NTIS
National Center for Health Statistics, Rockville, Md.
Uniform Hospital Abstract: Minimum Basic Data Set.
Aug 74, 24p DHEW/HRA-75/1451
This document is number 14 in the Vital and Health Statistics series four (Documents and Committee Reports).
Available from the Scientific and Technical Information Branch, National Center for Health Statistics, 5600 Fishers Lane, Room 8-20, Rockville, Maryland 20852, single copy free.

Descriptors: United States, Methodology, *Medical records, Management methods, Maintenance, Health related organizations, Health care, Development, Data, Data processing, Data collection, Data bases, Data acquisition, Confidential information.

A minimum basic data set for uniform hospital discharge abstracts is described, which is recommended by the U.S. National Committee on Vital and Health Statistics. The purposes which would be served by such data are reviewed, and criteria for inclusion of items of information are set forth as follows: (1) the item is considered useful to most if not all potential users including hospital administrators, medical staff, a variety of planning groups and legislative bodies, private and public third-party payers, and researchers; (2) the item is one which could readily be collected with reasonable accuracy; (3) the item should not duplicate data available from other sources; and (4) confidentiality of medical information should be preserved. Items constituting the minimum basic data set are as follows: person identification (not name); date of birth; sex; race; residence zip code; hospital identification number; admission and discharge dates; physician identification (both attending and operating physician); diagnoses; procedures and dates performed; disposition of patient, i.e., routine discharge, left against medical advice, discharged or transferred to another institution, discharged or referred to an organized home care service, or died; and elected principal source of payment. The potential of the minimum basic data set for use in area, State, and national hospital patient data systems is discussed. Expansion of the data set to meet special needs might include addition of the following items: source of patient, consultations, volume of laboratory or x-ray studies, tissue studies, anesthesia, variation from audit criteria, blood usage, nature of admission, service to which patient was admitted, accommodation within hospital, religion, living arrangement and marital status, occupation, street address, patient's name, and charges.

HRP-0006302/4GA Not available NTIS
American Association of Medical Clinics, Alexandria, Va.
Administrative Information System for a Group Practice Developing a Prepaid Health Plan.
1973, 178p
Contract PHS-HSM-110-71-148
Available from the American Group Practice Association, P.O. Box 949, Alexandria, Va. 22313, $20.00.

Descriptors: Private organizations, Private institutions, Methodology, *Information systems, Health resources, Health related organizations, Health maintenance organizations, Data processing, Data processing systems.

The history, development, and implementation of an administrative information system (AIS), designed for prepaid health plans, is described. Design criteria include: a predominantly manual system that would be capable of future conversion to automated data processing; a generalized design with procedures requiring minimal changes to the existing medical clinic operations; the capacity to operate in an existing group practice with a mixed fee-for-service and prepaid environment, with fee-for-service the dominant factor; a system capable of capturing all the data elements for Federal reporting; and an operation that is separate and distinct from, but integrated with, a prepaid accounting system. A description of the AIS includes an overall flow chart, and subsystems for: membership; service; clinic costing; reporting; and financing. The physical components are discussed, and the data elements, input, output, and systems files of the AIS are described. Appendices present an accounting system for a prepaid health plan, and a general design for a clinic costing subsystem developed for the Wichita Clinic Health Plan Administrative Information System.

JPRS-67530 PC$5.00/MF$3.00
Joint Publications Research Service, Arlington, Va.
Reference Aid Administrative Structure, Military Ranks and Organization, Police, Monetary Units, and Abbreviations Related to the Middle East Press.
30 Jun 76, 91p
Trans. from various journals.

Descriptors: *Middle East, *Terminology, *Handbooks, Public administration, Military organizations, Police, Finance, Mass media, Abbreviations, Foreign countries, Afro Asiatic languages, Translations, Information.
Identifiers: Monetary units, Transliterations.

This reference contains lists of political subdivisions of Middle East countries, together with lists of military ranks, military organizations, police ranks, and monetary units plus an alphabetical listing of abbreviations from the Middle East press.

JPRS-67708 PC$8.00/MF$3.00
Joint Publications Research Service, Arlington, Va.
Scientific Research Institutions of the System of the USSR Ministry of Agriculture, Address Directory.
4 Aug 76, 233p
Trans. of mono. Nauchno - Issledovatelskie Uchrezhdeniya Sistemy Ministerstva Selskogo Khozyaistva SSSR - Adresnyi Spravochnik, Moscow, 1974 p1216.

Descriptors: *Directories, *Schools, *Agriculture, *USSR, Organizations, Universities, Scientific research, Translations.

The report contains a complete listing of scientific agricultural institutions in the USSR, including addresses and telephone numbers in some cases. Institutes are grouped regionally.

JPRS-67763 PC$6.75/MF$3.00
Joint Publications Research Service, Arlington, Va.
Academy of Sciences General Meetings - 1976 Republic and USSR Sessions.
16 Aug 76, 174p
Trans. from various journals.

Descriptors: *Universities, *USSR, *Meetings, Translations, Scientific research, Technology.

The report contains information on USSR Academy of Sciences meetings in 1976 at both the republic and USSR levels. The annual meeting of the USSR Academy of Medical Sciences is also reported.

NTIS/PS-76/0720/3GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Urban Information Systems. Part 1. General (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
Mary E. Young. Sep 76, 155p*
Supersedes NTIS/PS-75/623, and Updates COM-74-11319.

Descriptors: *Urban information systems, *Bibliographies, Local government, Urban planning, Computer programming, Public administration, Municipal services, Municipalities, Land use, Regional planning, Management information systems, Information systems.
Identifiers: Municipal information systems.

Research is cited on urban management and municipal information systems. Part 1 includes reports not sponsored by USAC (Urban Information Systems Interagency Committee). The reports are intended for use by urban administrators and planners at all levels of management. (This updated bibliography contains 150 abstracts, 81 of which are new entries to the previous edition.) See also NTIS/PS-76/0721, Urban Information Systems. Part 2. USAC Reports.

NTIS/PS-76/0721/1GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Urban Information Systems. Part 2. USAC Reports (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
Mary E. Young. Sep 76, 367p*
Supersedes NTIS/PS-75/624, and Updates COM-74-11319.

Descriptors: *Urban information systems, *Bibliographies, Management information systems, Local government, Urban planning, Computer programming, Public administration, Municipal services, Municipalities, North Carolina, Ohio, Iowa, Pennsylvania, Oregon, California, Minnesota, Texas, Information systems.

Identifiers: *USAC project, Charlotte(North Carolina), Dayton(Ohio), Des Moines(Iowa), Lancaster County(Pennsylvania), Lane County(Oregon), Long Beach(California), Reading(Pennsylvania), Saint Paul(Minnesota), Wichita Falls(Texas).

Research on urban management and municipal information systems is presented. Part 2 consists of reports sponsored by USAC (Urban Information Systems Interagency Committee), organized by participating cities. These reports are on systems designed as models for future planning and use by all municipalities. (This updated bibliography contains 362 abstracts, 149 of which are new entries to the previous edition.) See also NTIS/PS-76/0720, Urban Information Systems. Part 1. General.

PB-255 932/6GA PC$16.25/MF$3.00
National Library of Medicine, Bethesda, Md.
Medical Subject Headings, Annotated Alphabetic List, 1977.
Aug 76, 671p* NLM-MED-76-04
Supersedes PB-243 901. See also PB-255 933.

Descriptors: *Subject index terms, *Information systems, *Information retrieval, *Thesauri, Medicine, Index terms.
Identifiers: *MESH, MEDLARS, MEDLINE, Biomedical information systems.

The Annotated Mesh is an expanded version of MeSH that is adapted to the needs of indexers, catalogers, and of persons searching the NLM computer data bases. Its use is strongly recommended to all MEDLINE users. Some information that they may find essential will not be available in the other edition of MeSH which is designed for Index Medicus users.

PB-256 315/3GA PC$4.50/MF$3.00
Bridgeport, Conn.
Bridgeport Area Manpower Information Systems Project.
Final rept.,
Jerry Y. Sedich, and John N. Valakas. 30 Jun 76, 70p DLMA-21-09-74-35
Contract DL-21-09-74-35

Descriptors: *Management information systems, *Manpower utilization, Cost analysis, Labor estimates, Demand(Economics), Supply(Economics), Personnel, Employment, Computer programming.

This report explains the Bridgeport CETA manpower information systems project. Three components of the project are considered. The first, the automated manpower management information system (MIS), was designed to replace the manual system, which is incapable of effective and efficient operational control and monitoring due to the large number of CETA clients in the Bridgeport area. Furthermore, the automated MIS goes one-step further and incorporates a cost-effectiveness analysis algorithm and permits a limited amount of impact and outcome analysis. The second component, the labor market information system (LMIS), consists of an automated economic index generator and an automated shift and shares model. The LMIS provides an excellent tool to analyze the economic health in the Bridgeport area and offers planners timely and relevant information for the decision making process. The third component serves as input for the LMIS and consists of a labor market supply/demand survey of the Bpt. area. The work closed with a proposal to link the MIS and LMIS sub-systems into one comprehensive manpower information system.

PB-256 478/9GA PC$5.00/MF$3.00
Systems Concept, Analysis, Development, Inc., Philadelphia, Pa.
Behavioral Field Study of 703 Users in Academic and Industrial Sci/Tech Libraries.
Final summary rept.,
Eugene Rawdin. Dec 75, 93p NSF-74-1S
Contract NSF-GN-42275
See also PB-256 479.

Descriptors: *User needs, *Libraries, Human behavior, Professional personnel, Requirements, Information retrieval effectiveness, Marketing, Information services, Statistical analysis, Industries, Universities, Surveys.

A field survey was conducted in 23 sci/tech libraries to determine the applicability of consumer behavior and marketing science to sci/tech libraries and their users. Survey instruments included unobtrusive observation plus brief interviews. Data obtained were compiled separately for industry and academia.

PB-256 479/7GA PC$12.75/MF$3.00
Systems Concept, Analysis, Development, Inc., Philadelphia, Pa.
Behavioral Field Study of 703 Users in Academic and Industrial Sci/Tech Libraries.
Final technical rept.,
Eugene Rawdin. Dec 75, 509p NSF-74-1T
Contract NSF-GN-42275
See also PB-256 478.

Descriptors: *User needs, *Libraries, Human behavior, Professional personnel, Requirements, Information retrieval effectiveness, Marketing, Information services, Statistical analysis, Industries, Universities, Surveys.

The purpose of the study was to test the hypothesis that principles and procedures used in marketing and consumer behavioral sciences can be successfully applied to interactions between such libraries and their patrons in a manner which produce useful insights for information vendors, library staff, funders and users.

PB-256 769/1GA PC$3.50/MF$3.00
National Conference of State Legislatures, Washington, D.C.
State-Federal Communications. Improving the Policy Information Systems for State Legislatures.
Conference summary,
D. D. Dunn. Jun 75, 24p NSF/RA-760070
Grant NSF-SP75-1011

Descriptors: *Information systems, *Government policies, *Meetings, State government, National government, Classifications, Improvement, Interactions, Project planning.
Identifiers: *Intergovernmental relationships, State legislatures, State federal communication.

This report is a summary of a one-day conference convened for the purpose of defining, for certain limited policy areas, the information needs of the state legislators so that the federal government might be more responsive. Attendees include leading state legislators, legislative staff persons, and a number of federal officials. The policy areas chosen are human resources, transportation, community development, criminal justice, and intergovernmental relations.

5C. Economics

AD-A029 195/5GA PC$4.50/MF$3.00
Training Analysis and Evaluation Group (Navy) Orlando Fla
A Study to Develop Management Indices for the Chief of Naval Education and Training. Phase II - Capital Resource Indices.
Rept. for Feb-Jul 76,
William M. Swope, and Curtis C. Cordell. Jul 76, 51p Rept no. TAEG-TM-76-2

Descriptors: *Naval training, *Cost analysis, Economic analysis, Budgets, Management information systems, Time series analysis, Resource management.

This report covers the second phase of a four phase study undertaken by TAEG at the request of CNET to investigate the need for improvement in the quality of management information. This report develops recommendations for a set of management indices covering the use of capital resources. This report provides the CNET and lower echelons of command a set of tools which can be used to identify inefficiencies that exist in the use of training resources. These indices will provide information useful to the decision maker in the establishment of policy, long-range planning, and the management of resources.

AD-A029 420/7GA PC$5.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
A Site Selection Model for the Modernized Army Ammunition Production Base.
Study project rept.,
John S. W. Fargher, Jr. Nov 74, 84p

Descriptors: *Munitions industry, *Site selection, Systems analysis, Logistics management, Logistics planning, Decision making, Uncertainty, Mathematical models, Ammunition, Production, Construction, Transportation.

A management model is derived from the interface requirements to best cope with the scenario of the site selection decision. Mathematical models combining economic and non-economic factors are presented for single-product, multi-location and a multi-product, multi-location problem. The first model can be utilized for sub-optimization for a decision for each product. The second model may be exercised for optimization of the total relocation problem considering budgetary and site constraints.

BTHE-020317 PC$28.00
British Standards Institution, Hemel Hempstead (England). Technical Help to Exporters.
Fuses: A Multinational Survey.
1976, 57p*
Price to members $20.00.

Descriptors: *Technical assistance, *Exporting, *Electric fuses, Standards, Wiring, Buildings, Circuits, Miniaturization, Electrical appliances, Regulations, United States, Europe, USSR, Electrical codes, Great Britain.

The survey identifies the types of fuses which are in common use in many countries of the world for the protection of electrical appliances and installations. This will help manufacturers to select the correct types of fuses for incorporation into equipment intended for export. This information has been obtained by visits to most of the countries and by questionnaire in other countries. The survey is not exhaustive and for some countries, such as USSR and China, complete information has not been obtained. The survey does not include fuses for special applications such as telecommunication equipment and automobiles.

DIB-76-08-502 PC$10.00/MF$3.00
IDC Europa Ltd., London (England).
Survey of World Markets for Computers and Peripheral Equipment, Netherlands.
Foreign market survey rept.
Apr 76, 120p
Sponsored in part by Bureau of International Commerce, Washington, D.C. Office of International Marketing.

Descriptors: *Market surveys, *Computers, *Netherlands, Data processing equipment, Cen-

tral processing units, Minicomputers, Exports, International trade, Market research, United States.
Identifiers: SIC 3573, SIC 9770.

The Survey of the Dutch Market for Computers and Peripheral Equipment has been conducted according to the following basic objectives: The development of an overview of the Dutch market for computers and peripheral equipment, as well as a market outlook through 1980; the identification of specific types of equipment which appear to offer significant sales potential over the next five years; the identification of particular market sectors which appear to offer the best opportunities for computer equipment sales; the identification of market conditions in the Netherlands which may facilitate or impede the importation and sale of U.S. - origin computer equipment; and an indication of the types of U.S. Department of Commerce - sponsored overseas trade events best suited for the promotion of U.S. computer equipment.

DIB-76-08-511 PC$10.00/MF$3.00
Price Waterhouse Associates Pty., Sydney (Australia).
Market Research Study for Australia in the Field of Security and Safety Equipment.
Foreign market survey rept.
Apr 76, 72p
Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Warning systems, *Australia, Security, Safety devices, Fire alarm systems, Detectors, Exports, Market surveys, International trade, United States.
Identifiers: SIC 3662, SIC 3861, SIC 3842, SIC 9770.

The report aims to inform current and potential U.S. exporters of the Australian market for security and safety equipment. In particular, four broad areas have been reported on: An assessment of market opportunities for U.S. suppliers of security and safety equipment and the suitability of U.S. Department of Commerce sponsored export promotion events; the identification of specific types of security and safety equipment for which the market appears to hold particular promise over the next three years; the identification of market conditions which facilitate or impede the importation and sales of U.S. origin security equipment; details of major prospective customers and principal potential agents and distributors for security and safety equipment.

PB-248 151-18/GA MF$3.00
Department of Commerce, Washington, D.C.
Commerce America. Volume I, No. 18.
30 Aug 76, 44p
Microfiche copies only.

Descriptors: *Commerce, *Periodicals, Ozone, Technology innovation, Patents, Foreign countries, Investments, Industries, International trade, Energy conservation, Research.

Contents:
Ozone theories probed from every angle;
Commerce's Patent and Trademark Office is improving efficiency, narrowing the chance of error;
Where foreign interests are positioned in U.S. industry;
Economic highlights;
International commerce report;
Energy digest;
Domestic business report.

PB-248 151-19/GA MF$3.00
Department of Commerce, Washington, D.C.
Commerce America, Volume I, No. 19.
13 Sep 76, 40p
See also PB-248 151-18.
Microfiche copies only.

Descriptors: *Commerce, *Periodicals, Businesses, Energy conservation, Prices, Sales, Profits, Research.

Contents:
All in a day's work-Commerce field offices answer business needs;
Energy saving at the grass roots--American ingenuity scores again;
Economic highlights;
International commerce report;
Energy digest;
Domestic business report.

PB-256 233/8GA PC$4.00/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Water Resources Research Center.
Land Prices in Flood Hazard Areas: Applying Methods of Land Value Analysis,
Demetrios Damianos, and Leonard A. Shabman. Apr 76, 50p VPI-WRRC-Bull-95, W76-11112, , OWRT-A-054-VA(3)

Descriptors: *Land, *Flood plains, *Economic analysis, Prices, Hazards, Economic impact, Market value, Management engineering, Hypotheses, Damage, Virginia, Economic surveys, Models, Flood control.
Identifiers: Case studies, Residential areas, Roanoke(Virginia), Radford(Virginia), Alexandria(Virginia), *Property values.

The report covers a case study approach to examine the influence on residential land prices of two factors: (a) the presence of flood risk, and (b) the use of structural or non-structural measures to minimize flood losses. The purpose was to see whether the influence of such factors on land prices could be isolated. Information of this kind would be useful in developing flood management policies that could lead to public support of the most efficient mix of alternatives for reducing flood damages. The market value of land, as used in this study, is defined within the context of an economic theory of land rent. The principal effort of the investigation was a statistical analysis of land sale prices directed toward isolating the influence of flood hazard. Two separate techniques of land value analysis were used.

PB-256 406/0GA PC$4.50/MF$3.00
United Indian Tribe of Western Oklahoma and Kansas.
Hog Bristle Processing By-Products and Paint Brush Manufacturing. A Feasibility Report.
1976, 67p EDA-76-022
Grant EDA-08-601573-1
Prepared by General Research Corp., Oklahoma City, Okla.

Descriptors: *Economic development, *Technical assistance, *Manufacturing, *Brushes, Paint applicators, Bristles, Marketing, Product development, Revenue, Profits, Operating expenses, Oklahoma, Kansas.
Identifiers: Hog bristles.

The report investigates the potential for the manufacture of natural bristle paint brushes and the potential for marketing bristle byproducts. The report also examines both the purchases of bristle on the open market and the use of bristle supplied by processing operations.

PB-256 423/5GA PC$4.50/MF$3.00
Chickasaw Nation of Oklahoma, Sulphur.
The Chickasaw Motor Inn. Operations Report, September 1972 - September 1975.
1975, 51p EDA-76-027
Grant EDA-08-6-01428
Prepared in cooperation with General Research Corp., Oklahoma City, Okla.

Descriptors: *American Indians, *Economic development, *Motels, Economic surveys, Minority groups, Businesses, Community relations, Industries, Profits, Oklahoma.
Identifiers: Minority owned enterprises, Chickasaw Indians.

In spite of the obstacles encountered the Chickasaw Motor Inn made steady gains. From major losses in fiscal 1973 the complex moved to breakeven in fiscal 1974 and to profitability in fiscal 1975. From a community embarrassment in 1973 the complex has been elevated to the most modern motel-restaurant facility in the area in 1975. Also, from a dead standstill in 1973 the Chickasaw Motor Inn has become the community's largest private industry.

PB-256 471/4GA Not available NTIS
International City Management Association, Washington, D.C. Management Information Service.
A Piece of the Pie: Minority Contractors in Evanston.
Final rept.,
Dennis E. Dawson. Apr 76, 9p ICMA/18724/MIS-4B76/N
See also PB-256 472.
Pub. in Management Information Service, v8 n4B p1-5 Apr 76.

Descriptors: *Contract administration, *Minority groups, *Local government, Municipalities, Illinois, Government procurement, Purchasing, Regulations, Economic development.
Identifiers: Reprints, Management Information Service reports, Minority contractors, *Evanston(Illinois).

In late 1973, Evanston, Ill. passed an innovative resolution which set in motion the affirmative action purchasing program, known locally as the 'set-aside program'. The affirmative action minority bid process described in this report has resulted in paving the way for minority contractors to share in the benefits of the competitive marketplace. In addition to describing their program, a copy of Evanston's resolution is included in the appendix.

PB-256 589/3GA PC$3.50/MF$3.00
Municipality of Aguadilla, Puerto Rico. Engineering and Planning Office.
Municipality of Aguadilla, Agudilla, Puerto Rico.
Final rept. August 74 to August 75.
Apr 76, 12p EDA-76-033
Grant EDA-01-6-09734-26

Descriptors: *Economic development, *Puerto Rico, *Social effect, Technical assistance, Federal assistance programs, Projects, Municipalities, Citizen participation, Construction, Centers, Public buildings.
Identifiers: *Aguadilla(Puerto Rico).

This report concerns the accomplishments of the citizens of Aguadilla from August 1974 to August 1975. During the first year of operation a total of fifteen important projects with significant social impact within the municipality were constructed or in the construction stage.

PB-256 650/3GA PC$5.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Div. of Minerals Engineering.
Impact of Rising Energy Costs on the Domestic Production of Selected Commodities,
Christopher Haycocks. May 76, 124p* BuMines-OFR-88-76
Grant G0133086

Descriptors: *Energy consumption, *Metal industry, *Iron and steel industry, *Oil shale industry, *Coal industry, *Economic analysis,

*Economic impact, Energy shortages, Electric power demand, Energy models, Production, Industries, Phosphate deposits, History, Forecasting.
Identifiers: *Phosphate industry, *Copper industry, Electric power consumption, Heat consumption.

The importance of energy in the future of both the United States and, indeed, the world's industrial development cannot be overemphasized. World consumption of energy has increased rapidly in recent years, reflecting the explosion in world industrial capability as well as the increase in standard of living. The purpose of this study is to determine what effect the increased power costs might have on the production of selected commodities in the United States. The commodities selected for study are: Bituminous coal, iron and steel, phosphate, copper, and oil shale.

PB-256 870/7GA PC$4.00/MF$3.00
Princeton Univ., N.J. Industrial Relations Section.
Constant-Utility Index Numbers of Real Wages.
Technical analysis paper (Final) 1 May-30 Sep 75,
John H. Pencavel. Aug 75, 37p ASPER/PUR/T-75/2067/A
Grant DL-B-9-M-5-2067
Prepared in cooperation with Stanford Univ., Calif.

Descriptors: *Earnings, *Sociometrics, Industrial relations, Salaries, Indexes(Ratios), Economic surveys, Income, Consumer affairs, Prices, Economic models.
Identifiers: Real wages, Take home pay, Standard of living, Hours of work, Wage rates.

The report questions the BLS index of a production worker's real spendable weekly earnings as a measure of the standard of living of the typical worker. (1) The BLS series does not discriminate between one situation in which wage rates are constant and hours of work have increased and a second situation in which hours of work are constant and wage rates have risen. (2) The BLS data neglect sources of income other than wages. (3) In converting the series on money earnings to real earnings, the BLS uses a base-weighted price index that exaggerates the cost of maintaining a level of utility whenever consumers are induced by relative price movements to substitute among the commodities they purchase. This paper responds to each of these problems by constructing index numbers of real income that derive from a measured relationship between a representative individual's level of utility, on the one hand, and the prices of consumer goods, the wage rate, and nonlabor income, on the other.

PB-257 015/8GA PC$3.50/MF$3.00
Yale Univ., New Haven. Dept. of Economics.
The Reliability of Industrial Location Surveys.
Working paper,
Sharon Oster. Jun 76, 19p EDA/OER-76/018
Contract EDA-PF-520

Descriptors: *Industrial plants, *Plant location, Industries, Site surveys, Decision making, Economic factors, Interviews, Reliability.

The objective of the paper is to provide at least some first-cut tests of the reliability of industrial location survey data. The tests reported in this paper suggest that survey data on the determinants of industrial location may be quite reliable.

PB-257 028/1GA PC$3.50/MF$3.00
Bureau of Labor Statistics, Washington, D.C. Div. of Local Area Unemployment Statistics.
PWEDA Area Employment and Unemployment, 1975 Annual Averages.
Sep 76, 10p BLS/PWEDA/AR-75/01

Descriptors: *Manpower, *Employment, *Unemployment, *Economic surveys, Counties, Legislation, States(United States), Statistical distributions, Statistical data, Summarizing, Federal assistance programs, Estimates.
Identifiers: Eligibility, Public Works and Economic Development Act of 1965, Annual summaries, Labor force.

This publication includes estimates of the labor force, employment, and unemployment for areas eligible for assistance under the Public Works and Economic Development Act of 1965 as amended (PWEDA). The data that follow are published in accordance with the requirements of Circular A-46 of the Office of Management and Budget. The data are the product of a Federal/state cooperative program in which State Employment Security agencies prepare labor force and unemployment estimates using concepts, definitions, and technical procedures established by the Bureau of Labor Statistics. Because of the small size of many of the areas, as well as limitations of the data inputs, these estimates are subject to considerable statistical error. Readers are cautioned that the data have been developed solely to satisfy a program need under PWEDA and should not be used for time series analysis. To find what counties are covered by this publication write to: Bureau of Labor Statistics, 441 G Street NW, Washington, D.C. 20212 Attn: Mr. Martin Ziegler.

PB-257 064/6GA PC$5.50/MF$3.00
RAND Corp., Santa Monica, Calif.
Public Works as a Countercyclical Device: A Review of the Issues.
Research rept.,
Roger J. Vaughan. Jul 76, 111p* R-1990-EDA, EDA/OER-76/022
Grant EDA-OER-490-G-75-15

Descriptors: *Business cycles, *Regional planning, *Public works, Countermeasures, Economic conditions, Government policies, Federal assistance programs, National government, Local government, Project planning, Economic analysis, Objectives, Employment, Performance evaluation, Financing, Classifications, Stabilization.
Identifiers: *Countercyclical projects, Alternatives.

Review of the issues presented in this report was undertaken for two purposes. The first is to define the issues relevant to the use of public works as a countercyclical device and to summarize what is known in areas relevant to these issues. The second is to provide inputs into the design of the empirical work presently being conducted as part of this project. This report examines seven major issues: (1) Objectives of a countercyclical public works policy; (2) identification of policy goals; (3) regional context of cyclical behavior; (4) input requirements for public works projects; (5) impacts of alternative methods of financing public works; (6) employment impacts of public construction investments; and (7) effectiveness of alternative stabilization instruments.

PB-257 067/9GA PC$5.50/MF$3.00
Rice Univ., Houston, Tex. Dept. of Economics.
Incidence of the Financing of Unemployment Insurance.
Final rept. Jan-Sep 75,
Charles E. McLure, Jr. Sep 75, 105p
ASPER/PUR-75/1074/A
Contract DL-B-9-M-5-1074

Descriptors: *Unemployment, *Insurance, *Financing, State government, Taxes, Rates(Costs), Economic models, Benefit cost analysis, Grants, Employment.
Identifiers: *Unemployment insurance, Experience rating, Subsidies.

Even with experience rating, the financing of unemployment insurance differs substantially from a system in which taxes paid by an industry roughly equal payments attributable to the industry. Since a system in which taxes just offset benefits would be neutral from the points of view of both equity and efficiency, it seems reasonable to treat the differences between taxes and benefits as net taxes and net subsidies. This paper uses a two-sector model to examine the incidence of the cross-subsidization of labor in various industries that is implicit in the present UI system. Whether or not labor gains relative to capital from the present cross-subsidies depends in a rather complicated way upon the elasticity of demand for the products, the ease of factor substitution and relative factor intensities in the two sectors, and the sizes of the two sectors.

PB-257 070/3GA PC$4.50/MF$3.00
Yale Univ., New Haven. Dept. of Economics.
The Effectiveness of the U.I. Program in Reducing Workers' Risk.
Final rept. Feb-Sep 75,
Martin Neil Baily. Sep 75, 51p ASPER/PUR-76/1845/A
Contract DL-B-9-M-1845

Descriptors: *Unemployment, *Insurance, Sociopsychological surveys, Projects, Criteria, Socioeconomic status, Economic surveys, Reference groups, Requirements, Performance evaluation.
Identifiers: *Unemployment insurance, Job search behavior.

This paper discusses, from the point of view of workers, the unemployment insurance (UI) program as insurance for workers, to determine how much insurance is needed and in what form it must be provided. Criteria for setting benefit levels were derived and these are compared to the existing UI program. UI as contingent saving is examined for limitations in the context of uncertainty. A sizeable fraction of benefits appears to be distributed to middle and even upper income families due to the insurance nature of the program. Models are developed to determine optimal values of search intensity and job acceptance. Some of the issues (including that of 'moral hazard') arising from the interaction between workers' and firms' behavior are noted.

PB-257 074/5GA PC$6.75/MF$3.00
Georgia State Univ., Atlanta. Dept. of Economics.
Income Distribution Effects of Manpower Programs.
Final rept. May-Nov 74,
Larry D. Schroeder, David L. Sjoquist, and Paula Stephan. Apr 75, 151p ASPER/PUR-74/0169/A
Contract L-74-169

Descriptors: *Personnel development, *Industrial training, *Economic analysis, *Income, Reference groups, Manpower, Economic models, Statistical distributions, Inequalities, Economic impact.
Identifiers: Manpower development programs, *Benefits.

Because of the lack of methodology for equity analysis, this study was able only to compile and review existing material in public finance to discuss the implications of studies of income distributional effects of manpower programs. The evidence suggests that higher income participants in manpower programs benefit more than do lower level participants, and that program benefits are maldistributed among the states. Estimates of short-run impacts of manpower programs have been made by construct-

ing a two-skill level three-sector theoretical equilibrium economic model which shows the transformation by manpower programs of a lower skill level of labor into a higher skill level, altering the distribution of income, with trainees benefiting relative to nontrained cohorts, while owners of capital find their returns on all labor increasing. Both stochastic and behavioral models of intergenerational income distribution and population mobility are considered, so that a combination of both methodological approaches should lead to improved intergenerational models.

PB-257 414/3GA PC$4.00/MF$3.00
Economic Development Administration, Washington, D.C. Office of Public Affairs.
Special Economic Development and Adjustment Assistance Program (Title IX).
Annual rept. 1975.
1975, 44p EDA-76-021

Descriptors: *Economic development, *Federal assistance programs, *Regional planning, Employment, Problem solving, Project planning, States(United States), Grants, Industrial relations, Reduction.
Identifiers: Title 9 assistance, Public Works and Economic Assistance Act of 1965, Economic dislocations, Economic adjustment, Economic decline, Military cutbacks, Industrial cutbacks, Plant shutdowns.

This publication is a guide on those areas which have come under the Special Economic Development and Adjustment assistance program (Title IX) Accomplishments of the agency under the program are contained in this report.

5D. History, Law, and Political Science

AD-A029 189/8GA PC$7.75/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Strategic Implications of Moscow's Concept for Collective Security in Asia.
Final rept.,
Alfred Biegel. 11 Jun 76, 218p

Descriptors: *International relations, *Geopolitics, *Asia, *USSR, Threat evaluation, Foreign policy, Political science, Attitudes(Psychology), Leadership, China, Government(Foreign), Treaties, United States government, Vietnam, Japan, India, Pakistan, Doctrine, Global, Theses.
Identifiers: Collective security.

Seven years have passed since Soviet Party Chief Brezhnev proposed the need for a system of collective security in Asia. Investigation reveals that Brezhnev's pronouncements on this subject were not propaganda exercises designed to secure short-term political objectives. Instead, as the thesis of this study demonstrates, the Soviet initiative for Asia constitutes a concrete, realistic policy option which challenges America's interests in that important region and deserves the attention of US strategists equal to that given Soviet interests in Europe. The Soviet 'Grand Design for Asia' represents a broad security framework as a means of bolstering the USSR's global position while enhancing the accomplishment of its increasingly crucial regional objectives and interests. The primary objective of the Kremlin's security design relates to the Sino-Soviet dispute. A secondary objective of Moscow's security scheme relates to the expansion of the USSR's regional power at the expense of the Western world. A more recent possibility of a Sino-Japanese partnership with the de facto backing of the United States has forced Moscow to focus its interests on its increasingly vital geopolitical East Asian front. Hence, Asia is now an area no less important to the interests of the USSR than Europe and the Middle East. The Pacific Doctrine, as articulated by President Ford in January 1976, declares the fundamental need for US strength to insure a stable balance of power in the Pacific.

AD-A029 204/5GA PC$6.75/MF$3.00
Rand Corp Santa Monica Calif
Outlook on Western Solidarity: Political Relations in the Atlantic Alliance System.
Interim rept.,
Horst Mendershausen. Jun 76, 156p Rept no. R-1512-PR
Contract F44620-73-C-0011
See also Rept. nos. R-1742-PR dated Nov 75, AD-A019 923 and RM-5881-PR, dated Dec 68, AD-684 152.

Descriptors: *NATO, *United States government, *International relations, Political science, Treaties, Foreign policy, Attitudes(Psychology), Leadership, Interactions, War potential, USSR, Threat evaluation, Detente, Foreign technology.

This is a report on the results of a study of the alliance system that waxes and wanes among the Western European countries and the United States. The relationships among the western allies are exhibited in historical perspective, looking forward from the early 1950s and backward from the 1970s. The central issue of the study is that of political solidarity among the states, the extent to which they have shown themselves motivated by similar or by diverse priorities in selected crisis situations and in institution building. The report especially notes the role of the European Community as a framework coexisting with the Atlantic Alliance. The outlook for Western solidarity is presented in the form of a number of observations illustrating the many ways in which the individual countries respond to challenges, past and present.

AD-A029 226/8GA MF$3.00
American Univ Washington D C Foreign Area Studies
Area Handbook for Spain,
Eugene K. Keefe, David P. Coffin, James M. Moore, Jr., Robert Rinehart, and Susan H. Scurlock. 1976, 440p DA-Pam-550-179
Availability: Paper copy available from GPO.

Descriptors: *Spain, *Handbooks, International relations, Political science, History, Economics, Government(Foreign), Military forces(Foreign), Leadership, Geography, Law(Jurisprudence), Industries, Commerce, Bibliographies.
Identifiers: *Area studies.

This volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future. The handbook seeks to present as full and a balanced an integrated exposition as limitations on space and research time permit. It was compiled from information available in openly published material. An extensive bibliography is provided to permit recourse to other published sources for more detailed information. There has been no attempt to express any specific point of view or to make policy recommendations. The contents of the handbook represent the work of the authors and FAS and do not represent the official view of the United States government.

AD-A029 462/9GA PC$5.00/MF$3.00
Assistant Secretary of Defense (Manpower and Reserve Affairs) Washington D C
A Report to Congress on U. S. Conventional Reinforcements for NATO.
Final rept.,
Robert J. Murray, and Herbert C. Puscheck. Jun 76, 80p

Descriptors: *NATO, *United States Government, *Military planning, Warsaw Pact countries, Threat evaluation, Military strategy, Military forces(United States), Military planning, Mobilization, Combat readiness, Deployment.
Identifiers: Military force posture.

The report describes US military commitments to NATO, the Warsaw Pact threat to NATO, NATO defense strategy, US forward deployed forces and plans for U.S. conventional reinforcement of NATO. The report analyzes current and projected US deployment capabilities. It also includes a summary of current problems, recent initiatives and suggested areas of legislative assistance.

AD-A029 490/0GA PC$12.00/MF$3.00
Naval Justice School Newport R.I.
Basic Military Justice Handbook.
Mar 76, 453p

Descriptors: *Military law, *Navy, *Handbooks, Documents, Criminal justice, Crimes, Classification, Punishment, Prisoners, Searching, Intoxication, Drug abuse, Drug addiction, Theft, Defense systems, Law enforcement.
Identifiers: Court martials, Uniform code of military justice.

This publication is designed to simply explain the rather complex legal principles and procedures inherent in the military justice system in order to assist the commanding officer, executive officer, legal officer, and discipline officer in discharging their responsibilities under the Uniform Code of Military Justice. In some cases the explanations of law have been somewhat over-simplified for the purpose of clarity and represent only general rules. There may be some uncommon situations where the general rule does not properly resolve the problem. Accordingly, the publication should not be utilized without supplementary legal research. It should be noted that the Basic Military Justice Handbook is divided into five separate sections as follows: -- survey of evidence for nonlawyers, basic military criminal procedure, Substantive law basic study guide, glossary of words and phrases, and common abbreviations used in military justice.

PB-256 661/0GA PC$4.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Standards and Water Quality Information Advisory Committee.
Summary of Contentions of Industry in Litigation Pending Under Sections 304(b) and 306 of Public Law 92-500.
Final rept.,
Martha Sager, Martin Brossman, Rose Mattingley, and Mario Fiol. Nov 75, 27p
ES/WQIAC-3

Descriptors: *Water pollution abatement, *Litigation, *Industries, Public law, Surveys, Statutes, Guidelines, Limits, Regulations.
Identifiers: *Federal Water Pollution Control Act Amendments of 1972, *Lawsuits, Substantive issues, Points of contention, Effluent Standards and Water Quality Information Advisory Committee.

The objective of this study was to prepare an analysis of the recurring points raised by industry in litigation related to guidelines/limitations promulgated under PL 92-500 for industry by EPA. Such an analysis and understanding of all substantive issues and their validity can focus attention and effort on remedial action. Specifically the analysis is designed to provide guidance and assist in establishing priorities

for ES&WQIAC in key areas for its future advisory duties on: Phase II and Group II industries; approaches for review and revision of promulgated standards; and needs for developing new procedures and approaches as a result of court action.

PB-256 796/4GA PC$7.50/MF$3.00
Kentucky Water Resources Research Inst., Lexington.
Legal Institutions for the Allocation of Water and Their Impact on Coal Conversion Operations in Kentucky.
Research rept.,
Richard C. Ausness, Gary W. Callahan, Steven W. Dills, Bill H. Flynn, and John S. Gillig. Aug 76, 196p RR-95, W76-11489, , OWRT-A-060-KY(2)
Contracts DI-14-31-0001-5017, DI-14-34-0001-6018

Descriptors: *Legislation, *Water law, *Coal preparation, *Kentucky, Water rights, Allocations, Policies, Water consumption, Licenses, Regulations, Coal gasification, Coal liquefaction, Cooling, Water supply.
Identifiers: Water allocation(Policy), Water permits.

Coal conversion plants require large quantities of water for cooling purposes and for use as a raw material. Three types of water allocation are presently used in the United States: riparianism, prior appropriation, and administrative permit systems. Kentucky presently has such a system of administrative allocation and this is described in the report.

PB-256 968/9GA PC$11.75/MF$3.00
Johns Hopkins Univ., Washington, D.C. Ocean Policy Project.
Perspectives on Ocean Policy: Conference on Conflict and Order in Ocean Relations, October 21-24, 1974, Airlie, Virginia.
Conference proceedings,
R. E. Osgood, A. L. Hollick, and C. S. Pearson. 1974, 445p NSF/RA/X-74-046
Grant NSF-GI-39643

Descriptors: *Oceans, *International law, *International relations, *Meetings, International government, Political science, Natural resources, Policies, Treaties, Economic development, Regulations, Regional planning, Statutes, Territorial seas, Environmental impacts, Ocean environments, Agreements, Law(Jurisprudence).
Identifiers: *Law of the Sea.

The conference was held as an outgrowth of the Ocean Policy Project established in 1972. The Project's objectives were: (1) to achieve a synthesis, as well as an analysis of ocean politics - the use of ocean space and its resources; and (2) to relate this synthesis and analysis to United States ocean policy options. The Panel Sessions compiled in this document include the following topics: (1) The Caracas Session in Review: Remarks on the Second Session of the Third Law of the Sea Conference; (2) The Role of Force in the Ocean; (3) Regional Approaches to Law of the Sea; (4) The North-South Split and the Law of the Sea Debate; (5) The Economics of the Law of the Sea Debate; (6) Ocean Rule-Making from a World Perspective; (7) Alternative Approaches to Order; (8) Geography and the LOS Debate; (9) Congress and a Law of the Sea Treaty; and (10) Future Prospects for Law of the Sea.

PB-257 186/7GA PC$9.00/MF$3.00
Library of Congress, Washington, D.C. Congressional Research Service.
Federal-State Election Law Survey: An Analysis of State Legislation, Federal Legislation and Judicial Decisions.
Quarterly rept. no. 3,
Elizabeth Yadlosky, and Thomas Durbin. 1 Sep 76, 270p* FEC/CH-76/007
See also PB-253 708.

Descriptors: *Elections, *Law(Jurisprudence), *Decisions, Surveys, Statutes, State government, National government, Legislation, Opinions, Litigation.
Identifiers: *Election laws, Court decisions.

Federal and state elections legislation, litigation and related state opinions are synopsized in this quarterly survey. This edition includes elections information compiled during the December 1, 1975-Sept. 1, 1976 time period. Report is divided into state by state legislation and litigation, state attorney's general opinions, and Federal legislation and litigation sections. A comprehensive subject index is also included.

PB-257 226/1GA PC$4.50/MF$3.00
Library of Congress, Washington, D.C. Congressional Research Service.
Analysis of Federal and State Campaign Finance Laws Enacted During 1976. Summaries,
Elizabeth Yadlosky. 1 Sep 76, 61p* FEC/CH-76/008
See also PB-255 115.

Descriptors: *Legislation, *Elections, Law(Jurisprudence), Government, Public law, Statutes, Financing.

Federal and state campaign financing laws are summarized in this quarterly report. This special edition includes campaign financing legislation that was enacted during 1976. Report is arranged on a state by state basis and contains appropriate Federal and state election code citations.

PB-257 259/2GA PC$3.50/MF$3.00
New York Sea Grant Advisory Service, Albany.
Landowner Liability, Posting, and Recreational Access.
Insight no. 5,
Michael Duttweiler. 1976, 16p NYSSGP-AS-76-003, NOAA-76061404
Sponsored in part by National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant.

Descriptors: *Law(Jurisprudence), *Public land, *Land titles, Regulations, Public law, Private law, Public relations, Recreational facilities, Real property.
Identifiers: Property damage, Citizen legal problems, Sea Grant program.

At the root of most conflicts between landowners and recreationists there seems to be a basic misunderstanding of trespass laws and landowner liability for recreationists by both landowners and sportsmen. This publication focuses on these two topics in the hope that some frictions may be eliminated through better understanding of individual rights and responsibilities.

5E. Human Factors Engineering

AD-A029 402/5GA PC$7.75/MF$3.00
Texas Inst for Rehabilitation and Research Houston Tex Biostereometrics Lab
Mass Distribution of the Human Body Using Biostereometrics.
Final rept.,u7622
R. L. Herron, J. R. Cuzzi, and J. Hugg. Jun 76, 202p AMRL-TR-75-18
Contract F33615-74-C-5121

Descriptors: *Anthropometry, *Human body, Measurement, Biomechanics, Analogs, Mass, Spatial distribution, Data processing, Photographic analysis, Coordinates, Analytic geometry, Center of gravity.
Identifiers: *Biostereometrics.

Biostereometrics is the spatial and spatio-temporal analysis of biological form and function based on principles of analytic geometry. When applied to humans, it constitutes a modern approach to anthropometry. A suitable stereometric sensor is used to locate the three dimensional coordinates of points distributed over the body surface. The coordinates serve as input to a digital computer which is programmed to yield permutations of numerical or analog (graphical or physical) outputs as the application requires. In the present study, stereophotogrammetry was used to obtain stereometric data in the form of Cartesian coordinates of six segmented human cadavers. Density data provided by the contractor (AMRL) were then used in conjunction with the stereometric data to generate mass, volume, center of mass and principal moments of inertia about the principal axes of inertia with the aid of an IBM 360-50 digital computer. This study was undertaken to further explore the viability of computing mass distribution from biostereometric data and the best available human density values.

AD-A029 417/3GA PC$4.00/MF$3.00
Manned Systems Sciences Inc Northridge Calif
Human Factors Research and the Development of a Manned Systems Applications Science: The Systems Sampling Problem and a Solution.
Technical rept.,
Dorothy L. Finley, and Frederick A. Muckler. Jul 76, 49p
Contract N00014-74-C-0324

Descriptors: *Human factors engineering, *Man machine systems, *Performance(Human), Classification, Taxonomy, Models, Systems analysis, Pilots, Flight crews, Crews, Population, Environments.
Identifiers: Situational research.

Human factors specialists, or 'systems psychologists', have extensively used the systems approach to define and solve man-man and man-machine problems. As of yet, however, there has been no attempt to develop a body of knowledge on the dimensionalization of manned systems. That is, a body of knowledge regarding what dimensions define a system, as opposed to such components as an individual operator or piece of equipment. For example, what classes of system dimensions are there and what role do they play in addressing what problems. For the operator component, for example, there are skill dimensions vs. ability dimensions; whether one works with one or the other or both classes depends on what the question is. It is suggested that a body of knowledge on manned systems dimensions would be useful as the stepping stone which facilitates the solution of new problems and as a basis for organizing human performance data in a way applicable to systems design problems. This report points out: (1) The need to begin indentifying and incorporating systems design and operation parameters into research programs (in addition to, for example, visual display and operator performance dimensions); (2) The nature of the systems research and dimensionalization problem, and (3) A model to support the systems dimensionalization process. This process is defined as essentially one of taxonomization for the purpose of developing the measure set. (Author)

AD-A029 542/8GA PC$3.50/MF$3.00
Army Aeromedical Research Lab Fort Rucker Ala
Depth Perception with the AN/PVS-5 Night Vision Goggle.
Final rept.,

Roger W. Wiley, David D. Glick, Carol T. Bucha, and Chun K. Park. Jul 76, 22p Rept no. USAARL-76u25

Descriptors: *AN/PVS-5, *Night vision devices, *Goggles, Visual perception, Helicopters, Discrimination.
Identifiers: *Depth perception, Stereopsis, Human factors engineering.

Laboratory measures of stereopsis and field measures of relative depth discrimination while using the AN/PVS-5 Night Vision Goggle were determined and compared with data of unaided eye performance. Using a modified Howard-Dolman apparatus, the stereoscopic threshold was found to be considerably degraded with the man-goggle system when compared to photopic unaided eye performance. Field measurements of relative depth discrimination using all available visual cues showed that performance of the man-goggle system was statistically equivalent only at intermediate distances of 500 feet or less.

AD-A029 650/9GA PC$4.00/MF$3.00
Naval Air Engineering Center Lakehurst N J Engineering Dept (Si)
Primary Flight Control Work Station Improvement Study.
Final rept. Jul 75-Jun 76 on Phase A,
Tak Po Sit, and Neal G. Senholzi. 23 Aug 76, 41p Rept no. NAEC-ENG-7916

Descriptors: *Command and control systems, Communication equipment, Interference, Noise, Visibility, Man machine systems, Circuits, Aircraft carriers.
Identifiers: *Human factors engineering.

This study shows that practical changes may be made by which the efficiency and effectiveness of the Pri-Fly Control Work Station can be improved. These recommended changes are grouped according to their impact in the areas of environment, communication, equipment arrangement and visibility. (Author)

5G. Linguistics

AD-A029 201/1GA PC$5.00/MF$3.00
Threshold Technology Inc Delran N J
Key Word Recognition.
Final technical rept.,
E. F. Grunza. Jul 76, 81p RADC-TR-76-211
Contract F30602-74-C-0101

Descriptors: *Word recognition, *Voice communications, Speech recognition, Phonemes, Pattern recognition, Phonetics, Computer applications, Minicomputers, Narrowband.
Identifiers: Feature extraction, VIP system, NOVA-1200 computers, Logic design.

This report describes the design, development and feasibility evaluation of a key word recognition system designed to detect key words/phrases embedded in narrow bandwidth conversational speech. It has been a goal that the techniques developed during this program be independent of the speaker. A real-time, dual processing level, key word recognition technique has been developed during this program. The technique utilizes the occurrence of a sequence of phonemic events to identify a candidate key word. A fine grained analysis is then performed on the speech segment containing the candidate word to determine if it is the key word of interest. A series of narrow band data recordings have been generated during the course of this investigation. An improved sequential logic element has been developed and the features and programmable sequential logic system of the RADC Voice Information Processor (VIP) has been interfaced to a minicomputer.

5H. Man-Machine Relations

AD-A029 344/9GA PC$4.00/MF$3.00
Woods Hole Oceanographic Institution Mass
Investigation of Operator Performance and Related Design Variables in Undersea Force Feedback Manipulator Systems, December 1975.
Technical summary rept. Nov 74-Dec 75,
W. R. Bertsche, A. J. Pesch, and C. L. Winget. Jun 76, 39p Rept no. WHOI-76-47
Contract N00014-74-C-0179
Prepared in cooperation with Eclectech Associates, Inc., North Stonington, Conn.

Descriptors: *Man machine systems, *Manipulators, *Operators(Personnel), *Underwater equipment, *Performance(Human), Underwater vehicles, Oceans, Interfaces, Test construction(Psychology), Job analysis, Skills, Feedback, Detectors, Control systems, Simulation, Force(Mechanics), Remote control, Human factors engineering, Systems engineering, Response, Servomechanisms.

The objective of the research described in this paper is directed toward the theoretical and experimental aspects involved in the matching of the skills of the human operator with the design of a complex manipulator system. It describes the progress of developing a series of standard engineering test procedures which provide a means of documenting independent variables selected for study. The analysis, definition, and selection of key variables present in force feedback manipulators has been included as a guide in the design of specific experiments. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-A029 165/8GA PC$6.00/MF$3.00
Operations Research Inc Silver Spring Md
Recommendations for Qualifications of Engineering Personnel of Nuclear-Powered Ships.
Final rept. Jul 75-Jul 76,
Perry Hall, Robert E. Lewis, David R. Roth , and Barbara Paramore. Jul 76, 150p ORI-TR-1011, USCG-D-76-76
Contract DOT-CG-41903-A
Prepared in cooperation with General Physics Corp., Columbia, Md.

Descriptors: *Nuclear powered ships, *Engineers, *Ship personnel, Merchant vessels, Qualifications, Training, Job analysis, Job training, Standards, Curriculum, Naval Personnel, Operations research, Naval training, Cargo ships, Regulations, Maintenance, Guides, Functions.
Identifiers: Savannah nuclear ship.

The report presents summary recommendations, based on task analysis, concerning training and other qualification requirements appropriate for personnel to serve on future new commercial nuclear ships. Training content and type (Classroom, shoreside practical/simulation, onboard) are recommended for 12 personnel functional areas. The study described in this report is seen as an initial step in the process of developing marine nuclear personnel requirements. Pertinent existing standards and legal requirements are taken into account in the recommendations; however, the need for regulatory guidelines specific to the Merchant Marine environment is identified. The task data presented offer a basis for specific training curriculum development once the regulatory guidelines are defined. In addition to the task data and summary recommendations, the report is a compendium of reference materials including description of the design proposals for new nuclear commercial ships; discussion of nuclear hazards; description of existing standards and legal requirements; and summaries of nuclear personnel requirements for the utilities, the U.S. Navy, and on the prototype NS SAVANNAH. (Author)

AD-A029 179/9GA PC$3.50/MF$3.00
Training Analysis and Evaluation Group (Navy) Orlando Fla
Training Resource Classifications: Direct-Indirect and Fixed-Variable Cost Categories.
Special rept. Feb-Jun 76,
William M. Swope, and Curtis C. Cordell. Jun 76, 23p Rept no. TAEG-TM-76-1

Descriptors: *Training, *Cost effectiveness, Naval budgets, Cost analysis, Management planning and control, Classification.
Identifiers: Training resources, *Naval training, Workshops(Meetings)..

At the Chief of Naval Education and Training (CNET) sponsored workshop held on 10 and 11 February 1976 to discuss the development of CNET management indices, the workshop participants recognized that ambiguity exists in the definitions used to classify training resources. CNET tasked the training Analysis and Evaluation Group to investigate the adequacy of current definitions of direct and indirect costs. The four resource cost categories of direct, indirect, fixed, and variable cause the greatest misunderstanding. This memorandum discusses the difficulties encountered when using these classification schemes and offers a set of definitions which attempts to remove the ambiguities associated with their use. (Author)

AD-A029 198/9GA PC$3.50/MF$3.00
Air Force Human Resources Lab Brooks AFB Tex
Hard Data Sources Concerning More Cost Effective Maintenance.
Final professional paper,
John P. Foley, Jr. Jul 76, 15p Rept no. AFHRL-TR-76-58

Descriptors: *Maintenance, *Human factors engineering, *Cost effectiveness, Life cycle costs, Air Force training, Electronic technicians, Enlisted personnel, Job training, Job analysis, Instructions, Military planning, Skills.

The paper introduces the interested reader to a number of maintenance related human factors technologies and topics. These are important in reducing life cycle costs of hardware systems. The high costs related to maintenance and maintenance personnel are primary causes of high life cycle costs. The type and length of many maintenance training programs, as well as job structure make substantial contributions to such costs. The topics discussed in the paper include job performance criteria; identification of maintenance tasks; measurement of ability to perform identified maintenance tasks; ways of obtaining the efficient performance of such tasks, such as job performance aids and task oriented training; the requirement for the restructure of maintenance jobs; as well as the need for integrating human factors maintenance technologies.

AD-A029 199/7GA PC$3.50/MF$3.00
Air Force Human Resources Lab Brooks AFB Tex
Some Key Problems Concerning the Specification, Development and Use of Task Identification and Analyses.
Professional paper,
John P. Foley, Jr. Jul 76, 12p Rept no. AFHRL-TR-76-57

Descriptors: *Air Force training, *Job analysis, Personnel development, Problem solving, Technology, Performance(Human), Optimization, Maintenance personnel.

Identifiers: Task oriented training, Job performance aids, Task analysis.

This paper concerns the problems involved in the development and use of task identification and analyses (TI and A) as a required part of the technologies of task (job) oriented training (TOT) and job performance aids (JPA). Such analyses are also required for optimum TOT/JPA tradeoffs. It stresses the fact that training which has the flavor of TOT and job guides which have the appearance of fully proceduralized JPA (FPJPA) can be produced without TI and A. However, the content of such training and job aids will be uncontrolled and likely incomplete. The usability of various formats of TI and A products as well as the special analyses required for troubleshooting (TS) aids are also discussed.

AD-A029 200/3GA PC$4.00/MF$3.00
Air Force Human Resources Lab Brooks AFB Tex
Assessment of AFROTC Detachment Effectiveness.
Final rept. Jun 75-Mar 76,
William E. Alley, and George L. Berberich. Jul 76, 29p Rept no. AFHRL-TR-76-38

Descriptors: *Air Force personnel, *Reserve Officer Training Corps, Productivity, Organizations, Effectiveness, Officer personnel, Procurement, Statistical analysis, Regression analysis.

This report summarizes a large-scale research effort directed at providing detachment evaluation data to the Air Force ROTC program. Multiple criterion measures were used in the analysis. These included traditional enrollment, production and unit cost data, as well as several longer-range indices of productivity based on graduate performance after entry to active duty (i.e., training elimination rates, on-the-job performance and retention). Criteria were developed by detachment for each year's input from 1964 to 1974(N = 65,000 individual case records). Multiple regression techniques were used to investigate sources of potential influence on the criteria: institutional characteristics of the host-college and program variations unique to the detachments. Applications of results in the assessment of both current detachments and potential host sites are discussed. Implications for policy change are summarized.

AD-A029 384/5GA PC$4.50/MF$3.00
Navy Personnel Research and Development Center San Diego Calif
Experimental Evaluation of PLATO IV Technology: Final Report.
Rept. for Jul 72-Jun 75,
Richard E. Hurlock, and Dewey A. Slough. Aug 76, 72p Rept no. NPRDC-TR-76TQ-44

Descriptors: *Computer aided instruction, *Naval training, Instructional materials, Adaptive training, Simulation, Students, Computer programming, Assessment.
Identifiers: Plato 4 System.

This project experimentally evaluated the computer-based instruction (CBI) technology of the PLATO IV system. The approach was to conduct a set of eight research studies in different Navy training application areas. Short titles of the studies were: remedial math, oscilloscope simulation, sine ratio, multimeter simulation, learner control, recipe conversion, oscilloscope guidance, and part-task trainer. The final report summarizes the research design, method, results, and findings of each study. Experience, information, and data obtained from the research is then used to evaluate instructional effectiveness, technical features and characteristics, range of training applications, instructional material development methods and effort, and development and delivery costs. Conclusions are drawn and recommendations are made about the use of a PLATO IV type system for CBI.

AD-A029 540/2GA PC$4.00/MF$3.00
Navy Personnel Research and Development Center San Diego Calif
Low Cost Part-Task Training using Interactive Computer Graphics for Simulation of Operational Equipment.
Technical rept. Jun 74-Jun 75,
Alice M. Crawford, Richard E. Hurlock, Robert Padilla, and Anthony Sassano. Sep 76, 33p Rept no. NPRDC-TR-76TQ-46

Descriptors: *Computer aided instruction, *Interactive graphics, *Computer graphics, *Training devices, *Individualized training, Simulation, Operators(Personnel), Naval training, Low costs, Pilots, Aircraft equipment.
Identifiers: *Part task training, S-3A Aircraft.

To investigate the effectiveness of this methodology, operations of the S-3A copilot integrated control system (INCOS) panel, involving procedural and simple perceptual motor skills, were selected for subject matter. Computerbased training (CBT) materials used consisted of interactive graphic simulations of appearances and operations of the INCOS panel. One group of students studied INCOS operations with the CBT materials, while another group went through the conventional INCOS training program which involves workbook study and hands-on practice with a high fidelity simulator. Two performance posttests were administered to all students in the simulator. Results showed that CBT students completed significantly more problems and took less time on both performance posttests. There was no significant difference between the performance of the CBT group before hands-on practice with the simulator and that of the conventionally trained group after this practice. The findings suggest that practice with the simulator could be eliminated for this phase of training. It was shown that considerable savings could be made if CBT was implemented in place of the conventional training program. It was concluded that the computer-based simulation had provided training which was not degraded by the absence of hands-on practice with actual equipment and that this methodology offers potential for low cost, part-task training. Recommendations were made for additional research into training using simulation. (Author)

AD-A029 632/7GA PC$6.75/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Some Causes of Conflicting Quality and Performance Standards of U. S. Army Enlistees 1973-1975.
Final rept.,
Robert H. Upchurch. 11 Jun 76, 168p
Master's thesis.

Descriptors: *Enlisted personnel, *Army personnel, All volunteer, Recruits, Recruiting, Attitudes(Psychology), Education, *Performance tests, Standards, Attrition, Army training, Effectiveness, Efficiency, Manpower, Motivation, Theses, Assessment.

This study investigates causes of the so-called 'Quality Enlistee Controversy' to determine why United States Army Recruiting Command (USAREC) data predicting quality of and success for enlistees in the All-Volunteer Army (AVA) seems to be contradicted by the judgments of training center cadre and using-unit officers and by significantly high early-discharge rates. The study concludes that causes of the 'Quality Enlistee Controversy' include (1) a lack of diagnostic testing to determine applicant attitude and capacity for motivation which now denies USAREC an objective basis for predicting success of enlistees, (2) USAREC's combined HSG classification of HSDG's and GED's which now results in misleading expectations, (3) USAREC, trainers, and users are applying 'quality' to different factors and that these factors in part account for what are mainly semantic differences among army echelons concerning 'quality enlistees/soldiers,' and (4) a pressure on recruiters to recruit a pre-determined high school graduate percentage which now results in a larger influx of GED's during February through May.

AD-A029 642/6GA PC$4.00/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Statistics
A Diffusion Approximation for a Repairman Problem with two Types of Repair.
Interim rept.,
Donald P. Gaver, and John P. Lehoczky. May 76, 34p TR-108, AFOSR-TR-76-1055
Grants AF-AFOSR-2642-74, NSF-AG-467

Descriptors: *Maintenance personnel, Stochastic processes, Approximation(Mathematics), *Aircraft maintenance, Repair, Equations, Diffusion, Civil aviation, Military aircraft.
Identifiers: *Repairman.

N aircraft are maintained by a service facility with single, multiple or infinite service. Each aircraft upon arriving may require one or both of two repair types. A diffusion approximation analysis is presented and the accuracy assessed by numerical methods. (Author)

HRP-0000366/5GA PC$4.00/MF$3.00
Illinois Univ. at the Medical Center, Chicago. Center for the Study of Patient Care and Community Health.
A Summary of Sources and Suggestions for Mechanisms to Develop a Manpower Inventory in the State of Illinois,
Allyn K. O'Byrne. 1973, 39p

Descriptors: *Health manpower, *Health occupations, Sources, Data acquisition, Inventories, Health resources, Illinois.

The paper describes sources and mechanisms for preparing lists of professional and technical personnel employed in the health field, for use in the University of Illinois Area Health Education System (AHES). Two broad categories of health personnel are considered. The first consists of those occupations licensed by the State Board of Registration and Education, and the second consists of those occupations certified by other mechanisms, primarily professional organizations. This paper includes 20 health occupations licensed by the State of Illinois, and an additional 18 certified allied health occupations. Portions of this document are not fully legible.

HRP-0000658/5GA PC$6.00/MF$3.00
Illinois Regional Medical Program, Chicago.
Proceedings of Symposium on Paramedical Education and Career Mobility Held at Evergreen Park, Ill. on June 6 and 7 1968.
1968, 138p
Sponsored by Little Co. of Mary Hospital, Evergreen Park, Ill., and Moraine Valley Community Coll., Palos Hills, Ill.

Descriptors: *Paramedical personnel, *Meetings, *Health manpower education, Personnel development, Medical personnel, Curricula, Specialized training, Manpower requirements, Allied health personnel, Health occupations.

The proceedings are presented of an interdisciplinary symposium on paramedical educa-

tion which focused on the concepts of regional medical education, core curriculum, career mobility, and new avenues of approach to health manpower shortage problems. Identifying the manpower shortage as the fundamental problem in the health care industry today, symposium participants considered causes and solutions, agreeing that a balance should be maintained between education and training and that skills could be acquired while useful service is provided to society. Papers were presented on career mobility in the allied health occupations; problems of overeducation and undereducation and how they relate to the shortage of paramedical specialists; the team approach to health care; and changing patterns in education.

HRP-0000665/0GA PC$3.50/MF$3.00
Illinois Regional Medical Program, Chicago.
Techniques and Organization for Recruitment: The Quest for Candidate Quality,
Don C. Frey. 1970, 11p
Proceedings of Annual Meeting on Association of Schools of the Allied Professions (3rd), Held at Chicago, Illinois, November 23, 1970.

Descriptors: *Health manpower, *Meetings, Students, Recruiting, Requirements, Health education, Organizational theory, Personnel development, Health occupations, Vocational guidance.

At the third annual meeting of the Association of Schools of the Allied Health Professions in Chicago, 1970, potential innovations in recruitment techniques and organization at the high school level were discussed in terms of current health manpower needs. A health careers council is a useful organizing method, as is the utilization of volunteers and professionals, monthly newsletters, and community health center committee task forces for finance, scholarships, career guidance, and public information.

HRP-0003178/1GA Not available NTIS
National League for Nursing, Inc., New York. Div. of Research.
From Student to RN. A Report of the Nurse Career - Pattern Study.
Lucille Knopf. 1972, 175p DHEW/NIH-72-130
Contracts PHS-70-4117, PHS-70-4096
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $1.00.

Descriptors: Universities, Students, Schools, Retention, *Registered nurses, Recruiting, *Nurses, Methodology, Medical education, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education.

A study initiated in 1962 by the National League for Nursing to obtain information about the characteristics of nursing students, their occupational goals, their reasons for choosing nursing as a career, and the relation of these variables to the students' completion of the nursing program and to their subsequent work in nursing is documented. Supported by the Division of Nursing, Public Health Service, DHEW, the study was extended to include those students who in 1965 and 1967 entered educational programs to prepare for practice as registered nurses. Data were gathered through a series of questionnaires sent to more than 42,000 freshmen entering associate degree, diploma, and baccalaureate nursing programs in 1962 and 1965. Data are presented and analyzed relative to: characteristics of entering students; comparisons of characteristics of those who graduated from programs and those who withdrew; and variables related to graduation and withdrawal. A narrative summary of the highlights of the findings is included, together with a discussion of implications of the data. Supporting data are presented in 135 tables. Details of methodology and sampling techniques, and samples of questionnaires used in the study are appended.

HRP-0003182/3GA Not available NTIS
American Nurses' Association, Inc., Kansas City, Mo.
Nation's Nurses: 1972 Inventory of Registered Nurses.
Aleda V. Roth, and Alice R. Walden. 1974, 128p
Available from the American Nurses' Association, 2420 Pershing Rd., Kansas City, Mo. 64108, $3.00.

Descriptors: United States, Statistical distributions, Registered nurses, *Nurses, *Health resources, Health occupations, Health manpower, Health care, Distribution, Demography, Communities.

This document presents the results of a 1972 nationwide survey of nurses conducted by the American Nurses' Association to measure the actual volume of nurse manpower and to determine its distribution. Extensive tabular material provides data on the registered nurse population, employed registered nurses, employment setting, areas of clinical practice, and an analysis of inactive nurse manpower. Information was gathered through State licensing procedures. A uniform set of questions was included on licensure applications, and some special studies were undertaken through use of questionnaires. A total of 1,127,657 registered nurses were identified as holding licenses to practice. This figure represents a 33 percent increase during the past decade. Trends indicating a fall in the proportion of inactive registered nurses under 30 and a rise in the number of older nurses maintaining active licenses also were identified. This inventory indicates that over three-fourths of the manpower projected for 1975 for registered nurses is available; but the number of baccalaureate level nurses falls far short of the projected need, and some areas of the country are experiencing shortages of nurses.

HRP-0004740/7GA Not available NTIS
American Association of Colleges of Pharmacy, Silver Spring, Md.
Pharmacy Manpower: Current Status and Future Requirements.
Christopher A. Rodowskas. 1973, 9p
This article is a composite of eight separate speeches presented at eight district meetings of the National Association of Boards of Pharmacy - American Association of Colleges of Pharmacy during August to November, 1972.
Pub. in Medical Marketing and Media v8 n7 p18, 20-28, 30 Jul 73.

Descriptors: Health occupations, Health manpower, *Health care requirements.

Plans for a study of current and future pharmacy manpower needs are outlined. Based on the limited amounts of existing pharmacy manpower information, an analysis of the problems of determining manpower requirements is presented. The possibility that oversupply of pharmacists may result in unemployment or underemployment such as has occurred in the teaching, engineering, and physics fields is discussed. Consideration is given to the attrition rate of pharmacists, and to sources of replacement for those leaving the field or moving to different areas within the field. Adjustments must be made for productivity, including that of the increasing numbers of female pharmacists. Selected pharmacy manpower statistics for the eight districts of the U.S. are presented in text and tabular format. To determine future patterns of practice, the Pharmacy Manpower Information Project was established to acquire, edit, and code data to initiate a perpetual information system. A questionnaire has been prepared for distribution to pharmacists by boards of pharmacy, who will enclose the questionnaire with license renewal or new license mailings.

HRP-0009005/0GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Training of Mid-Level Health Workers.
Alfred M. Sadler. May 74, 17p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48014, $.50.

Descriptors: Physician extenders, *Physician assistants, Michigan, Health occupations, *Health manpower education, Health education.

Recent developments in the training of mid-level health workers (MLHW) are reviewed so that alternatives for training in Michigan can be placed in a national perspective. MLHWs are defined as nonphysician health personnel trained to carry out many of the primary medical functions and tasks which previously have been the sole province of the physician. The MLHW category includes physician's assistant, physician's associate, nurse practitioner, MEDEX, primex, and health associate. Three model programs are described: the Duke Physician's Associate Program, the University of Colorado's Pediatric Nurse Practitioner Program, and the MEDEX Program of the University of Washington. Reasons for training MLHWs are suggested, and a brief history of the MLHW is provided. The following areas of concern to all MLHW training programs are discussed: admissions, curriculum planning, evaluation, and placement of graduates. Other considerations in the training of MLHWs, such as training institutions, funding, regulation, and accreditation, are discussed.

HRP-0009744/4GA Not available NTIS
Michigan Univ., Ann Arbor. Medical School.
Reducing Nursing Turnover.
Thomas F. Lyons. 1970, 6p
Pub. in Hospitals, Jnl. of the American Hospital Association p74-78 Oct 70.

Descriptors: Research, Registered nurses, *Nurses, Health resources, Health occupations, Health manpower, Health care delivery.

A study of nursing personnel turnover in a large general hospital is documented which attempted to determine organizational, administratively controllable factors contributing to that turnover. In the hospital studied, nursing personnel annual turnover was approximately 40 percent; about 30 percent of this was voluntary. Questionnaires were administered to all registered nurses in the hospital and to some nurses who had left the hospital. The study measured the degree of psychological withdrawal or propensity of remaining nurses to leave, i.e., the degree to which a nurse wanted to leave her job. Propensity to leave was found to be significantly related to voluntary turnover. All but one of 21 measures of job satisfaction, tension, role clarity, communication, and coordination were related significantly to propensity to leave. Study data also support the hypothesis that communication and coordination affect role clarity, job satisfaction, and tension. When responses of nurses who had left their jobs were compared with those of nurses who remained, voluntary turnover was found to be related to: dissatisfaction with the hospital as a place to work; dissatisfaction with the job; feelings of unreasonable pressure; concern over having too much work; concern because the amount of work interfered with its quality; unclear rules, regulations, and limits of authority; difficulty in exchanging information with others; inadequate explanation of decisions affecting the

job; poor planning of work assignments among different departments; and poorly timed activities. Implications of the study findings for hospital administrators are discussed. No tabular data included, nor is a copy of the study instrument provided.

HRP-0009746/9GA Not available NTIS
Illinois Univ. at the Medical Center. Coll. of Nursing.
Influence of Rewards and Incentives on Staff Nurse Turnover Rate.
Joanne McCloskey. 1974, 9p
Pub. in Nursing Research v23 n3 p239-247 May-Jun 74.

Descriptors: Statistical distributions, Research, Registered nurses, Regions(United States), Personnel development, *Nurses, Mobility, Illinois, Health resources, Health occupations, Health manpower, Health manpower education, Health education, Health care, Health care delivery, Distribution, Demography, Continuing education, Communities, California.

A study of the influence of specific safety, social, and psychological rewards and incentives on the rate of nursing staff personnel turnover in selected general hospitals in Chicago, Illinois and San Francisco, California is documented. A three-part questionnaire was returned by 94 full-time registered nurses who had left staff positions during the four months prior to the study. Data reveal that psychological rewards were more important than safety or social rewards in keeping these nurses on the job. Younger nurses and new graduates had the highest turnover. Single nurses stayed no longer than did married nurses. Amount of spouses' salaries did not affect turnover, and there was no difference in turnover rates between diploma and baccaulaureate nurses. Higher pay did not retain the nurse, nor was she influenced by a specialty area. Most nurses wanted opportunities to attend educational programs, to continue course work for credit, to seek career advancement other than to the head nurse position, and to have their work recognized by peers and supervisors. Study findings indicate that incentives of retirement programs and maternity leaves for nurses should be replaced by incentives of part-time work opportunities and child care facilities. Several of the most influential rewards, it is noted, concern the intellectual environment of the hospital. The unanimous choice of psychological rewards over safety and social rewards strongly indicates that nurses left jobs for lack of internal rewards; study findings indicate more specifically that while external rewards may draw a person to a job, internal rewards keep her there. Implications of the study findings for hospital and nursing service administrators are discussed. Details of survey and analysis methodology are provided, together with tabular data.

JPRS-67680 PC$3.50/MF$3.00
Joint Publications Research Service, Arlington, Va.
Civil Aviation Enrollment Announcement.
30 Jul 76, 16p
Trans. of mono. Ministerstvo Grazhdanskoi Aviatsii Ob Yavlyaet Priem v Uchebnye Zavedeniya Grazhdanskoi Aviatsii, Perm, 1975.

Descriptors: *Civil aviation, *Schools, *Directories, USSR, Programmed instruction, Identifying, Sites, Engineering, Students, Personnel selection, Translations, Requirements.
Identifiers: Geographic locations.

The report contains addresses and programs of USSR schools of civil aviation, and qualifications necessary for prospective students. Correspondence courses for mechanical, electrical and radio engineers are also described.

PB-256 247/8GA PC$4.50/MF$3.00
Pittsburgh Univ., Pa.
Theoretical Issues in the Estimation of Production Functions in Manpower Programs.
Technical analysis paper (Final) Sep 74-Feb 75,
Burt S. Barnow. Feb 76, 72p ASPER/PUR/T-75/0823/A, , ASPER/ORE/TAP-39
Contract DL-B-9-M-5-0823

Descriptors: *Specialized training, *Personnel development, Cost benefit analysis, Project management, Attitudes, Education, Disadvantaged groups, Effectiveness, Social services, Mathematical models, Productivity, Efficiency, Qualifications, Statistical analysis, Unemployment, Manpower utilization.

The primary purpose of this paper is to develop a theoretical framework for applying the economic theory of production to manpower training programs in general, with particular emphasis on the programs currently being funded under the Comprehensive Employment and Training Act of 1973 (CETA). The cost/benefit analysis framework that has been used in most previous evaluations of manpower programs is explained as it relates to the production function framework. Specific topics considered include the problems of defining and measuring the inputs and outputs, the problems in determining the functional form, and a discussion of specification errors (such as unobservable variables and fallible measures of variables) which can occur and how they can affect empirical results. The production function theory is applied to manpower training programs and, in addition to the topics mentioned above, a technique is described for pricing the outputs of the program.

PB-256 316/1GA PC$4.00/MF$3.00
Oklahoma State Dept. of Vocational and Technical Education, Stillwater.
The Impact of Vocational and Technical Education on Manpower and Economic Development.
Research rept.,
Francis T. Tuttle, and Arch B. Alexander. May 76, 43p* EDA/OER-76/009
Grant EDA-PF-505

Descriptors: *Industrial training, *Skilled workers, Personnel development, Vocational guidance, Technical schools, Economic development, Manpower utilization, State government, National government, Economic assistance, Information systems, Oklahoma.

This report presents an examination of the problems, opportunities, and subsequent actions that EDA might take to assist state and sub-state training agencies in making their training programs more relevant to their areas' economic development needs. Part I, entitled 'The Role that Facilities Play in Attracting New Capital Investments in Distressed Economic Areas,' discusses instructional facilities, state equipment pools, and mobile vo-tech facilities. Part II concentrates on management information and is entitled 'The Role that Adequate State and Local Vo-Tech Management Systems Play in Focusing Training Funds Toward Real and Identifiable Training Needs.' Part III is 'Suggestions for Making Federal Agencies More Effective in Assisting Industrial and Economic Development,' with EDA getting particular attention.

PB-256 798/0GA PC$5.00/MF$3.00
Princeton Univ., N.J.
On the Structure of Unemployment in Britain and the U.S.
Final rept. May-Sep 75,
David Metcalf. Sep 75, 79p ASPER/PUR-75/2980/A
Contract DL-B-9-M-2980
Prepared in cooperation with Reading Univ., (England).

Descriptors: *Unemployment, *Economic surveys, United States, Great Britain, Comparison, Cycles, Rates(Per time), Time, Services, Differences, Foreign countries.
Identifiers: Occupations, Employment services, Economic indicators.

Three aspects of unemployment are discussed here. In each case the American and British experience are compared and contrasted. First, modern analysis of unemployment emphasizes that the rate of unemployment is determined by flows into unemployment and the duration of unemployment. These concepts are examined and evidence on their magnitudes over the cycle and across demographic and occupational groups is presented. Second, the reason for the stability of the structure of unemployment across geographic areas is analyzed and new empirical evidence on the factors associated with area unemployment differentials is presented. Third, the relative success of the two employment services (ES) is discussed and new empirical evidence on the cyclical behaviour of certain ES performance indicators is presented. Differences in duration of unemployment largely determine the structure of spatial unemployment. Factors which might influence the duration of unemployment must be analyzed.

PB-256 803/9GA PC$4.50/MF$3.00
North Carolina Univ., Chapel Hill. Dept. of Economics.
Simultaneous Equations Models of Sex Discrimination.
Final rept. Feb 75-Apr 76,
Solomon W. Polachek. Apr 76, 57p
ASPER/PUR-75/1808/B
Contract DL-B-9-E-5-1808

Descriptors: *Discrimination, *Females, Personnel selection, Education, Employment, Salaries, Earnings, Manpower utilization, Qualifications, Statistical analysis.

This report develops models to help ascertain whether sex discrimination is predominantly supply or demand oriented. The labor market and the human capital market are analyzed separately within simultaneous equation settings. Much of the evidence on sex differences within the labor market is reviewed, and sex differences in human capital acquisition are analyzed. The interrelationships between both markets are explored.

PB-256 804/6GA PC$4.00/MF$3.00
North Carolina Univ., Chapel Hill. Dept. of Economics.
Occupational Segregation Among Women: A Human Capital Approach.
Final rept. Feb 75-Apr 76,
Solomon William Polachek. Apr 76, 29p
ASPER/PUR-75/1808/A
Contract DL-B-9-M-5-1808

Descriptors: *Females, *Career development, Manpower utilization, Personnel development, Depreciation, Discrimination, Earnings, Education, Personnel selection, Qualifications, Employment, Unemployment.

An alternative theory for occupational segregation of females is posited. The way in which occupational choice among women varies with life cycle labor force participation is illustrated. By assuming the existence of varying rates of atrophy (i.e., depreciation occurring during periods of labor force intermittency) as well as varying compensating market rental rates per unit of human capital for each occupation, the decision of occupational choice is embedded into the human capital framework. The effect of home time on occupational choice is measured to test the hypothesis which states that those females with greater labor force intermittency are more likely to be in occupations with a low rate of atrophy.

PB-256 832/7GA PC$10.50/MF$3.00
George Washington Univ., Washington, D.C. Manpower Research Projects.
A Longitudinal Study of Selected Out of School NYC-2 Programs in Four Cities.
Final rept.,
Regis H. Walther, and Margaret L. Magnusson.
Jun 75, 362p DLMA-41-0-003-09-4
Grant DL-41-0-003-09
See also PB-222 323.

Descriptors: *Youths, *Disadvantaged groups, Specialized training, Attitudes, Evaluation, Manpower, Unskilled workers, Motivation, Negroes, Interviews, Surveys.
Identifiers: Neighborhood Youth Corps.

Research studied the effectiveness of redesigned NYC-2 Neighborhood Youth Corps in Atlanta, Baltimore, Cincinnati and St. Louis through longitudinal study of 502 NYC-2 enrollees; through comparisons with predecessor NYC-1 in two sites, and through experimental/control group comparisons in one site. Study results evidenced the seriousness of employability problems among young, disadvantaged school dropouts in the site cities. Program components associated with good employment outcomes included job placement, worksite job development and placement, and completions of skill training. Overall, however, results did not indicate that NYC-2 programs were more effective than NYC-1 programs in achieving employability for enrollees.

PB-256 834/3GA PC$6.00/MF$3.00
Austin Coll., Sherman, Tex.
Changing Tasks and Roles in Higher Education; A Total Institutional Project at Austin College.
Summary rept. 1972-75,
John D. Moseley. 1975, 135p
See also PB-256 835. Prepared in cooperation with National Science Foundation, Washington, D.C. Science Education Directorate, and National Endowment for the Humanities, Washington, D.C.

Descriptors: *Universities, *Education, Project planning, Programmed instruction, Participative management, Revisions, Instructors, Students, Organization theory, Roles(Behavior).
Identifiers: Austin College, Educational tasks, Liberal arts courses, Institutional change.

From 1972 through 1975 Austin College conducted a Total Institutional Project, supported by major funding from the National Endowment for the Humanities and the National Science Foundation. The Project aided implementation of a new educational program called IDEAS (Individual Development: Encounter with the Arts and Sciences). Working together over four years, faculty and students in a series of six-week Summer Resource Laboratories examined and restructured nearly every course and educational program. New syllabi were developed, many with new ways of organizing classes. The progress made toward change of tasks and roles and how it came about make up this story of the Total Institutional Project.

PB-256 835/0GA PC$4.00/MF$3.00
Austin Coll., Sherman, Tex.
Changing Tasks and Roles in Higher Education, the Austin College Total Institutional Project, the Advisory Panel.
Final rept. Jun 72-Nov 75,
Horace Hartsell, Harold L. Hodgkinson, Wayne H. Holtzman, and John W. Macy. Dec 75, 33p
Grants NEH-ED71-28-72459, NSF-GY-10413
See also PB-256 834.

Descriptors: *Universities, *Education, *Roles(Behavior), Interpersonal relations, Projects, Programmed instruction, Organization theory, Revisions.
Identifiers: Higher education, Austin College, Educational tasks, Liberal arts courses, Institutional change.

In 1972 Austin College, a private liberal arts college of 1200 students, presented jointly to the National Endowment for the Humanities and to the National Science Foundation a proposal for a Total Institutional Project on Changing Tasks and Roles in Higher Education. Both agencies responded with support for the Project designed to install a new educational program to facilitate more active and individualized learning roles for students, more responsive roles for faculty, and development of strategies of continuing self-renewal for the College. An advisory panel of nine nationally prominent educators served the Austin College Project in a variety of ways within a collective and continuing relationship over a three year period.

PB-256 836/8GA PC$6.00/MF$3.00
Worcester Polytechnic Inst., Mass.
Restructuring Undergraduate Science Education. A Summative Assessment by the NSF-Worcester Polytechnic Institute Project Advisory Committee Constituted from 1972-75. Project Report No. 1,
Lee Harrisberger, Bruce Mazlish, George Pake, Kenneth Picha, and Eugene D. Reed. 1975, 131p
Grant NSF-GY-9353
See also PB-256 837.

Descriptors: *Engineering education, *Experimentation, Project planning, Students, Objectives, Instructors, Universities, Learning, Evaluation.
Identifiers: *Curriculum development, *Individualized instruction, Innovation.

In 1968 Worcester Polytechnic Institute undertook a major educational planning effort which led two years later to the adoption by the faculty of a new academic philosophy and the accompanying systematic program redesign which differs markedly from the traditional approach to the education of engineers and scientists. The new program has become known as the WPI Plan. With the total resources of the College committed, WPI since 1970 has been embarked on a seven-year implementation program placing extreme demands on all concerned. The grant included several provisions for external evaluation of the program, one of these evaluations being based upon the periodic reports of a visiting committee of seven distinguished representatives from the fields of education, science, engineering and industry.

PB-256 837/6GA PC$5.00/MF$3.00
Worcester Polytechnic Inst., Mass.
A Guide to Off-Campus Student Project Center Operations. Project Report No. 2,
Francis C. Lutz, James S. Demetry, Allen H. Hoffman, Calton W. Staples, and Stanley D. Weinrich. Dec 75, 99p
Grant NSF-GY-9353
See also PB-256 836 and PB-256 838.

Descriptors: *Engineering education, *Experimentation, Project planning, Students, Objectives, Instructors, Universities, Learning, Evaluation.
Identifiers: *Off campus facilities, *Curriculum development, Individualized instruction.

During the 1974-75 Academic Year, Worcester Polytechnic Institute opened an off-campus, educational project center in Washington, D.C. An on-site director, supported by an on-campus administrator, and assisted by four other faculty members, staffed the center during its first year of operation. Sixty-six undergraduate students completed educational projects for academic credit, in cooperation with fourteen Washington-based organizations. The operation of the center, including the definition of program objectives, and the program's development, implementation, and follow-up are presented. Guidelines are indicated for financing an off-campus center. As the concept of an off-campus educational center is highly transferable to other institutions, this Guide is intended to facilitate the adoption of those elements of the WPI center applicable to the majority of postsecondary institutions.

PB-256 838/4GA PC$7.50/MF$3.00
Worcester Polytechnic Inst., Mass.
The Impact of the WPI Plan on Students. A Report of a Three Year Longitudinal Study at Worcester Polytechnic Institute, Worcester, Massachusetts, 1972-75. Report No. 3,
Karen C. Cohen. 1975, 179p
Grant NSF-GY-9353
See also PB-256 837.

Descriptors: *Engineering education, *Experimentation, Students, Attitudes, Project management, Objectives, Instructors, Universities, Learning, Evaluation.
Identifiers: *Curriculum development, *Individualized instruction, Innovation.

In looking at the effects of the WPI Plan on its student body, two general categories of questions seemed paramount: (1) to what extent are the Plan's goals being met, and (2) how well does the collection of educational strategies assembled to deliver and produce these educational goals work. More specifically, there were several sub-sets of questions involved in each of these areas. In terms of meeting general Plan goals, the authors were interested in seeing both if WPI students as a group changed over time and/or in comparison with students at other, more traditional engineering schools, and if this change involved things such as acquiring more positive self-images, positive attitudes towards their programs and futures, confidence in their ability, increased ability to relate science and technology meaningfully, motivation to work and study on one's own, ability to work well together in groups, valuing things other than those technological, and if the educational climate or environment changed in any way.

PB-256 855/8GA PC$5.50/MF$3.00
Center for Policy Research, Inc., New York.
Labor Market Analysis: A Review and Analysis of Manpower Research and Development.
Final rept.,
Trevor Bain. Jun 75, 111p DLMA-21-36-74-19
Grant DL-21-36-74-19

Descriptors: *Industrial relations, Employment, Unemployment, Females, Minority groups, Youths, Disadvantaged groups, Salaries, Supply(Economics), Demand(Economics), Labor relations, Manpower requirements, Rural areas, Urban areas, Vocational guidance, Personnel selection, Education, Specialized training.

This report has reviewed, synthesized and analyzed the findings of completed and ongoing research and development work sponsored by the Manpower Administration, and related literature that has explored the operation of the labor market. The report presents an overview of labor markets and manpower forecasting and traces the operation of the labor market from job search to placement and promotion. The findings are interpreted for its usefulness to the Department of Labor, other Government agencies, manpower planners and practitioners, elected officials, educators, employers, unions and researchers. The report includes a bibliography of the literature on the subject and a short summary of major published sources of labor market information.

PB-256 864/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The ICET Testing Program for the Certification of Engineering Technicians.
Final rept.,
Stephen T. Margulis. 1976, 4p
Pub. in Professional Engineer, p30-31 Mar 76.

Descriptors: *Achievement tests, *Paraprofessional personnel, *Engineers, Criteria, Qualifications, Requirements, Decision making, Evaluation.
Identifiers: *Certification, Reprints.

The Institute for the Certification of Engineering Technicians (ICET) certifies engineering technicians nationally. New criteria for voluntary certification have been instituted recently. Central to the approach is a new testing program to determine the technical competence of candidates. Those applying for Associate Engineering Technician or Engineering Technician status are required to pass a written examination; those applying for Senior Engineering Technician status must prepare a 5000-word technical essay. The testing program is described and evaluated and special uses for the written examinations, which ICET proposes, are reviewed. Overall, the testing program suggests careful test development and a desire for continuing development. Tests appear to be technically sound. Plans for test evaluation, by ICET, will more clearly establish the strengths and weaknesses of the tests. Special uses for the tests--for assessing technical obsolescence as part of a continuing professional development program, and for helping candidates prepare for the written examination by completing a short version of the test, are commendable additions to the testing program.

PB-256 874/9GA PC$3.50/MF$3.00
Bureau of Social Science Research, Inc., Washington, D.C.
Self-Perceived Social Value and Moral Qualities of One's Work: Neglected Social Dimensions for Quality of Employment Indicators.
Final rept. Jul 73-Feb 76,
Albert D. Biderman, and Thomas F. Drury. Apr 74, 15p ASPER/CON-73/0118/C
Contract L-73-118

Descriptors: *Employment, *Attitudes, *Social psychology, Sociometrics, Job satisfaction, Perception, Quality of life, Evaluation.
Identifiers: Social indicators.

Measures are proposed of the impacts workers see their work having on others and the degree to which they feel their work has or lacks various moral qualities. Such measures would have significance from the conventional economic, individualistic, hedonistic, and behavioral perspectives underlying most quality-of-work indicators, but to the extent that it is determined that these social and moral considerations enter importantly into workers' overall evaluations of their jobs. From a societal viewpoint, measures of self-perceived social and moral job qualities and of the importance workers attach to them, constitute important social indicators in their own right.

PB-256 877/2GA PC$6.00/MF$3.00
Minnesota Univ., Minneapolis. Dental Information Service Center.
The Dental Information Service Center: Opportunities in Dental Practice. Operations Manual.
Final rept.,
David O. Born, James F. Blahnik, and Michael D. Peterson. Jul 75, 136p HRA/OC-76/100
Contract N01-DH-24272
Also available in set of 4 reports as PB-256 876-SET, PC$19.00/MF$6.00.

Descriptors: *Dental personnel, *Employment, *Information systems, Information centers, Manuals, Computer programs, Placement, Health manpower, Dental services.
Identifiers: Appendices.

The Opportunities in Dental Practice Service is designed to function as a clearinghouse for information relating to employing auxiliary manpower, to establishing or purchasing dental practices and to locating other dental employment opportunities. Using a computer program which seeks to match applicant needs with dental opportunities, the service operates on a file of continually updated information and generates individualized placement reports on a regular basis to all employers, communities and applicants listed with the service. This manual describes the system, the operating procedures and the computer programs necessary for implementation and provision of these placement services.

PB-256 878/0GA PC$6.00/MF$3.00
Minnesota Univ., Minneapolis. Dental Information Service Center.
The Dental Information Service Center: Design and Development.
Final rept.,
David Omar Born, James F. Blahnik, and Michael D. Peterson. Jul 75, 145p HRA/OC-76/101
Contract N01-DH-24272
Also available in set of 4 reports as PB-256 876-SET, PC$19.00/MF$6.00.

Descriptors: *Minnesota, *Management information systems, *Dental personnel, *Health manpower, Design, Surveys, Employment, Tables(Data), Recommendations, Education, Information centers, Placement, Information retrieval, Minnesota, Surveys, Data acquisition.
Identifiers: Appendices, Continuing education.

In Minnesota, between 1972-74, an effort was made to apply management information systems techniques to a variety of problems in the dental manpower area. Focal point for this effort was the Dental Information Service Center. This document records the history of the design and development of this research and service facility. The report also contains an overview of the Center's Practice Location SEARCH Service, the Opportunities in Dental Practice placement service and the Continuing Dental Education Records Service. A section is devoted to a description of the manpower research program at Minnesota, including a detailed analysis of the survey instruments used for data collection. Recommendations for similar efforts are included in an assessment of the Minnesota program.

PB-256 879/8GA PC$5.00/MF$3.00
Minnesota Univ., Minneapolis. Dental Information Service Center.
The Dental Information Service Center: Continuing Dental Education Records Service. Operations Manual.
Final rept.,
David Omar Born, Michael D. Peterson, and James F. Blahnik. Jul 75, 90p HRA/OC-76/102
Contract N01-DH-24272
Also available in set of 4 reports as PB-256 876-SET, PC$19.00/MF$6.00.

Descriptors: *Dental personnel, *Information systems, Records, Computer programs, Manuals, Health manpower, Data processing systems, Information centers.
Identifiers: *Continuing education, Appendices.

The Continuing Dental Education Records Service is one of the information services developed by the Dental Information Service Center. The service is designed as an aid to state boards of dentistry, to state dental associations and to other agencies faced with the complex task of monitoring participation in continuing dental education activities. The service involves four components: the individual participant, the continuing education program sponsor, the monitoring agency and the data processing center. The center performs all necessary recordkeeping functions and generates periodic reports to both users and the monitoring agency. The Continuing Dental Education Records Service relies heavily on cooperation by participants and by program sponsors. The flow of information involves the participant turning in a personalized electronic data card to the program sponsor; the sponsor then submits all such cards to the data processing center which compiles individual record files. On a periodic basis, all files are reviewed and statistical reports are submitted to the monitoring agency.

PB-256 880/6GA PC$5.00/MF$3.00
Minnesota Univ., Minneapolis. Dental Information Service Center.
The Dental Information Service Center: Dental Practice Location Search Service. Operations Manual.
Final rept.,
David O. Born, James F. Blahnik, and Michael D. Peterson. Jul 75, 77p HRA/OC-76/103
Contract N01-DH-24272
Also available in set of 4 reports as PB-256 876-SET, PC$19.00/MF$6.00.

Descriptors: *Dental personnel, *Information systems, Communities, Employment, Placement, Decision making, Characteristics, Manuals, Computer programs, Information retrieval.
Identifiers: Community profiles.

The Dental Practice Location SEARCH Service is a placement-related function of the Dental Information Service Center. The SEARCH Service consists of a data bank of community profile information and an access program which enables a user to specify individual preferences on community characteristics. As a result of the SEARCH process, community profiles are generated as output; these profiles describe only communities which match the user's particular preference pattern. Feedback is also provided which informs the user as to the effect of his preference criteria on the universe of communities. The volume documents the computer programs used for the SEARCH Service and outlines all necessary operating procedures.

PB-256 965/5GA PC$6.75/MF$3.00
Illinois Univ. at Urbana-Champaign. Policy Studies Organization.
Policy Studies Directory (Second Edition),
S. Nagel, and M. Neef. 1976, 155p* NSF/RA-760189

Descriptors: *Universities, *Programmed instruction, *Policies, *Directories, Political science, Surveys, Schools, Questionnaires.
Identifiers: *Colleges, Masters degrees, Doctorate degrees.

This is the second edition of a recurring directory designed to describe, on a school-by-school basis, the policy studies activities in college and university political science departments or interdisciplinary policy studies programs. The schools surveyed consist of all universities or colleges that offer either a Ph.D. degree or M.A. degree in political science. The activities surveyed consist of the interdisciplinary policy studies programs that are included on the list of the National Association of Schools of Public Affairs and Administration which have a political science component, but that are not exclusively political science, public administration or business administration programs.

PB-257 016/6GA PC$4.00/MF$3.00
Human Interaction Research Inst., Los Angeles, Calif.
Designing a Demonstration Project to Facilitate the Utilization of Its Results.
Final rept.,
Harvey L. Ross. Sep 76, 46p DLMA-92-06-72-27-1
Contract DL-92-06-72-27

Descriptors: *Manpower utilization, *Project planning, *Employment, Consulting services, Placement, Economic models, Documentation, Performance, Disadvantaged groups, Objectives, Methodology, Research, Design.
Identifiers: *Demonstration projects.

The study reports an attempt to provide utilization consultation to an operating manpower project. Learnings drawn from the consulting effort include the following: (a) budgetary provision should be made for utilization activities, and staff roles clearly delineated; (b) if a project lacks internal expertise in documentation/evaluation, the early help of a resource person is desirable; (c) those involved in the project should concur on objectives, and the planning to achieve them; (d) problems that arise should be dealt with promptly; (e) involvement of program operating personnel in the planning of RU activities seems advisable; a mutually involved relationship can more efficiently identify the best ways to implement the project's concept in other settings. To facilitate utilization of project results, the author proposes an open systems organizational model for demonstration projects.

PB-257 056/2GA PC$9.00/MF$3.00
Kirschner Associates, Inc., Washington, D.C.
National Evaluation of MDTA Apprentice Training.
Final rept.,
Jack Dickerson, Edward P. Davin, Lynn Bell, Marc Jacobs, and Andrea Morrell. May 76, 261p MEL-76-04
Contract DL-13-11-74-01

Descriptors: *Apprenticeship, *Specialized training, *Performance evaluation, *Construction industry, Manpower utilization, Federal assistance programs, Minority groups, Disadvantaged groups.
Identifiers: *Manpower development programs, Veterans(Military personnel).

This report is a nationwide assessment of various forms of apprenticeship training for special worker groups (especially minorities, disadvantaged workers and Vietnam veterans) in selected construction trades. The training was provided by national unions and employer groups under Department of Labor contracts.

PB-257 058/8GA PC$5.00/MF$3.00
Civil Service Commission, Washington, D.C. Office of Labor-Management Relations.
Assignment and Scheduling of Work in Federal Labor Agreements.
Final rept.
Aug 76, 77p USCSC/OLMR-76/14

Descriptors: *Government employees, *Labor unions, *Agreements, National government, Information systems, Allocations, Scheduling, Job analysis, Surveys.
Identifiers: Labor agreement information retrieval system, Work shifts.

This report provides a review and analysis of provisions on the assignment and scheduling of work in Federal labor agreements. The survey is based on Federal agreements contained in the Labor Agreement Information Retrieval System (LAIRS) file. Key elements discussed include basic patterns of allocating work; permanent and temporary assignments; moonlighting; contracting out; shifts and tours of duty; and overtime. Sample provisions are cited extensively throughout the report.

PB-257 065/3GA PC$5.00/MF$3.00
Stanford Univ., Calif. Dept. of Economics.
Signalling and Screening.
Final rept. May 75-Jan 76,
Michael Spence. Jan 76, 76p ASPER/PUR-75/2648/A
Contract DL-B-9-M-5-2648

Descriptors: *Manpower, *Economic models, Information systems, Resource allocation, Allocation models, Social welfare, Statistical analysis.
Identifiers: *Labor market, Human capital.

The goals of this paper are to survey and extend in certain areas analysis in the area of signalling and screening (a collection of models dealing with the informational aspects of labor market models). The signalling model, the rationing model, and the human capital model are reviewed. These three signalling models are similar in terms of resource allocation, but differ in the welfare implications of the pattern of resource allocation that develops. A version of the model containing signalling and human capital is set forth to estimate the contribution of ability and schooling to productivity. A model of self-help selection with contingent contracts is developed using a large number or continuum of people of the type employed in the preceding analysis of signalling. A model incorporating the rationing, human capital and signalling model and the simple rationing model is used to illustrate the use of the latter to augment returns to the signal in the market without rationing.

PB-257 071/1GA PC$3.50/MF$3.00
Delaware Univ., Newark. Dept. of Economics.
Economic Impacts of a Particular Public Service Employment Program.
Final rept.,
Charles R. Link. Aug 76, 25p ASPER/PUR-76/3663/A
Contract DL-B-9-D-6-3663

Descriptors: *Unemployment, Project planning, Services, Social welfare, Salaries, Sex, Age, Education, Ethnic groups, Surveys, Economic analysis, Insurance.
Identifiers: Public services, Unemployment insurance exhaustees.

The goal of this report is to shed some light on the economic effects of a particular public service employment program which has been proposed involving unemployment insurance (UI) exhaustees. The program is described, and an empirical study is discussed which determines the reservation wage of UI exhaustees by sex, race, education, and age. The results suggest that the main willing participants in a work relief program would be low-educated black and white women with dependents. It is concluded that a public service employment program with a low wage would gain little support from exhaustees regardless of their race, education or dependents status. Fragmentary evidence was presented which suggested the availability of a substantial number of jobs in the private sector which would pay comparable wages.

PB-257 106/5GA PC$10.00/MF$3.00
Nassau County Multi-Municipal Productivity Project, Mineolta, N.Y.
Multi-Municipal Productivity Project.
Final evaluation rept. Nov 72-Jul 75.
Jul 75, 341p* ASPER/CON-74/0074/B
Contract L-74-74

Descriptors: *Productivity, *Industrial relations, *Personnel development, *Government employees, New York, Counties, Municipalities, Civil service, Labor unions, Demographic surveys, Attitude surveys, Job analysis, Salary surveys, Specialized training, Projects, Local government, Grants, Financing, Models, Manuals.
Identifiers: Needs, Nassau County(New York), Hempstead(New York), North Hempstead(New York), Oyster Bay(New York).

Three programs of a local government employee productivity project are discussed: the demographic and attitudinal survey program determining employee attitudes and opinions in relation to improving productivity; the personnel survey program to survey salary levels and job specifications and determine the impact of and training necessary to implement job specification changes, and the productivity bargaining program. A formula was developed to calculate effects of productivity improvements, and output measures were developed and tested. A demographic and attitudinal data bank was created, and a procedural manual developed. A labor-management liaison network was established and a PBI (public sector deferred compensation trust fund based on productivity savings) was designed as an incentive.

PB-257 217/0GA PC$6.00/MF$3.00
Kentucky Research Foundation, Lexington.
Negro Occupational Status and Education: Special Analysis Under the Negro Employment in the Seven Southern SMSA's' Study.
Final rept.,
Virgil L. Christian, Jr., and F. Ray Marshall. 31 Nov 74, 145p DLMA-21-21-74-27
Grant DL-21-21-74-27

Descriptors: *Employment, *Negroes, *Demographic surveys, Municipalities, Projects, Economic conditions, Ethnic groups, Education, Georgia, Alabama, Texas, Kentucky, Tennessee, Florida, Louisiana, Statistical data, Income, Differences, Socioeconomic status, Migrations.
Identifiers: Black white comparisons, Occupations, Standard metropolitan statistical areas, Atlanta(Georgia), Birmingham(Alabama), Houston(Texas), Louisville(Kentucky), Memphis(Tennessee), Miami(Florida), New Orleans(Louisiana).

The principal objective of this report was to use data from the 1970 Census of Population to update, validate, and reinforce the findings of the SMSA Studies made for the Negro Employment in the South project. Those studies, which covered Atlanta, Birmingham, Houston, Louisville, Memphis, Miami and New Orleans, relied heavily on EEO-1 data; the researchers sought to determine and analyze the patterns of black employment in those cities. The following questions are addressed: (1) Do the EEO-1 data adequately represent all firms, large and small, in the seven Southern urban labor markets; (2) Are migration trends in Southern SMSA's causing racial income and occupational gaps to widen; (3) What is the amount of the black's income disadvantage at a given occupational level; (4) What is the size of income and occupational gaps between blacks and whites.

PB-257 221/2GA PC$4.50/MF$3.00
United States R and D Corp., New York.
An Industry-Specific Approach to Layoff Time Training, the Job Advancement Training Program.
Final rept. 1 Jul 72-31 Aug 73,
William T. McGrath. 12 Sep 73, 63p DLMA-82-34-70-31-3
Contract DL-82-34-70-31
See also PB-217 105.

Descriptors: *Unskilled workers, *Specialized training, Disadvantaged groups, Manpower utilization, Minority groups, Attitudes, Vocational interests, Upgrading, Literacy, Effective-

ness, Personnel development, Food industry, Qualifications.

The project was a demonstration program designed by private industry (the USR&D Corp., NY) to test the viability of operating a successful non-skills layoff time training program (LOTT) in certain seasonal industries. From previous experience with LOTT, the project hypothesized that when an industry meets certain specific criteria then employers, unions and locked-in workers in that industry will perceive value in and respond positively to a non-skills LOTT program. Such a training program was designed and successfully operated in an industry meeting the defined screening criteria. These operations provide evidence that the 'screening criteria' may be valid predictors of whether a given industry is an appropriate setting for a non-skills LOTT program.

PB-257 267/5GA PC$4.00/MF$3.00
Michigan Univ., Ann Arbor. Dept. of Economics.
The Efficacy of Public Service Employment Programs.
Technical Analysis Paper,
George E. Johnson, and James D. Tomola. Jun 75, 30p ASPER/INH/T-75/017A/A, ,
ASPER/ORE/TAP-17A
Prepared in cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: *Personnel selection, *Project planning, Effectiveness, National government, State government, Local government, Skilled workers, Unskilled workers, Statistical analysis, Inflation(Economics).
Identifiers: *Public service employment.

Five major evaluation questions associated with Public Service Employment (PSE) are distinguished and discussed. It is concluded that there is a severe potential problem of a fiscal substitution effect, i.e., state and local governments may use PSE subsidies to do what they would have done anyway and simply reduce property and other local taxes. It is found that the Public Employment Program (PEP) participants were taken largely from the middle of the skill distribution. Estimates of the inflationary impact of a large scale PSE program (without fiscal substitution) are presented. Unless PSE programs concentrate on workers of higher than average skill level, they will be no more inflationary than other forms of fiscal policy per unit of unemployment reduction.

5J. Psychology (Individual and Group Behavior)

AD-A029 383/7GA PC$4.00/MF$3.00
Navy Personnel Research and Development Center San Diego Calif
Effect of Human Relations Training on Racial Attitudes of Marines.
Final rept. Jan-Apr 74,
William F. Kieckhaefer. Aug 76, 44p Rept no. NPRDC-TR-76TQ-42

Descriptors: *Attitudes(Psychology), *Racial discrimination, Human relations, Race relations, Training, Bias, Marine Corps personnel, Test construction(Psychology).

The purpose of this study was to develop tests and methodologies to measure both racial attitudes of Marines and the effect of training at the Marine Corps Human Relations Institute (HRI) on those attitudes. A pilot test of a Social Distance Scale (SDS) and a Situational Attitude Scale (SAS) revealed that two types of racial bias occurred on the SDS: positive/negative racial attitudes and interracial/intraracial bias. In line with the purpose of the HRI training program, it was hypothesized that the training would affect a decrease in both types of bias on both measures of racial attitudes.

AD-A029 387/8GA PC$5.00/MF$3.00
Navy Personnel Research and Development Center San Diego Calif
Determination of Criteria of Operational Unit Effectiveness in the U.S. Navy.
Interim rept. FY 75-76,
Samuel E. Bowser. Aug 76, 88p Rept no. NPRDC-TR-76TQ-41

Descriptors: *Organization theory, Criteria, Effectiveness, Systems analysis, Manpower utilization, Cost benefits, Navy, Productivity, Surveys.

The criteria for evaluating organizational effectiveness are considered within a system framework. A general review of the literature is presented. Operational unit management personnel were interviewed and this interview material was content analyzed. The resulting content categories were cross compared by unit type, position in the organization, rank of respondent and question answered. The results show military managers to be performance oriented and supportive of objective type criteria for evaluations.

AD-A029 452/0GA PC$8.00/MF$3.00
Illinois Univ At Urbana-Champaign Dept of Psychology
The Vocabulary of Brain Potentials: Inferring Cognitive Events from Brain Potentials in Operational Settings.
Progress rept. 1 Jul 75-1 Jul 76,
Emanuel Donchin. Aug 76, 226p
Contract N00014-76-C-0002, ARPA Order-3053

Descriptors: *Bioelectricity, *Brain waves, Cerebral cortex, Stimuli, Response, Performance(Human), Information processing, Voltage, Recording systems, Test methods, Electroencephalography, Tracking, Psychophysiology, Cybernetics, Man machine systems, Computer applications, Adaptive systems, Waveforms.
Identifiers: *Cortical potentials, Event related potentials, Cognition, Voltage fluctuations, Biocybernetics.

This report outlines the experimental progress of the biocybernetics project in FY 1976, describes the facilities of the Cognitive Psychophysiology Laboratory, and outlines directions of current and future research. The separate components of the event related potential (ERP) are described, emphasizing the relation to task relevance, event expectancy, and information content. Also the ability to employ single trial extraction techniques for ERP classification utilizing discriminant analysis is demonstrated. Experimental reports describing these research efforts are included.

AD-A029 517/0GA PC$3.50/MF$3.00
Air Force Human Resources Lab Brooks AFB Tex
Comparison of ASVAB Test-Retest Results of Male and Female Enlistees.
Final rept. Jul 74-Oct 75,
Lonnie D. Valentine, Jr., and Iris H. Massey. Jun 76, 23p Rept no. AFHRL-TR-76-43

Descriptors: *Aptitude tests, *Attitudes(Psychology), Enlisted personnel, Air Force personnel, Males, Females, Comparison, Performance(Human), Statistical analysis, Analysis of variance.
Identifiers: Armed services vocational aptitude battery, Test retest programs.

Male and female enlistees were compared on the basis of their performance on the Armed Services Vocational Aptitude Battery. Mean Aptitude Index scores were compared for male and female enlistees on the original testing and on retest. Males scored higher on mechanical and electronics, and females scored higher on administrative and general. Both males and females tended to do poorer on retest that they had on the original test. The USAF Enlistment Attitude Survey administered shed no light on possible cause for lower scores on retest. Comparisons of test-retest correlations with expectations based on known test reliability suggests that non-standard testing conditions may prevail in operational testing.

AD-A029 529/5GA PC$5.50/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Attitudes Toward Fear of Death and Dying among Army Officers.
Final rept.,
Clara L. Adams. 11 Jun 76, 111p
Master's thesis.

Descriptors: *Attitudes(Psychology), *Death, Leadership, *Army personnel, *Officer personnel, Questionnaires, Theses, Fear, Combat readiness, Personality, Education, Religion, Aviation personnel.
Identifiers: Age distribution, Experience, Maturity.

The attitudes toward fear of death and dying among Army officers are of military importance because of their potential influence upon abilities to cope with the responsibilities of leadership. This study sought to determine if there were differences in the expressed attitudes of Army aviators and combat officers. It was hypothesized that aviators would express less fear of death and dying than the combat officers, and that the rationale for the difference was a difference in training. Investigation revealed that there was a tendency for aviators to express less fear of death and dying than combat officers. It was found that there are other factors such as age, experience, religion, and education which may influence fears and fear management.

AD-A029 671/5GA PC$5.50/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Responsibility: As Attributed by U.S. Army Officers.
Final rept.,
Francis J. Sisti. 11 Jun 76, 118p
Master's thesis.

Descriptors: *Interpersonal relations, *Officer personnel, *Army personnel, *Attitudes(Psychology), Perception(Psychology), Analysis of variance, Questionnaires, Social psychology, Attitudes(Psychology), Methodology, Theses.
Identifiers: Responsibility.

The cognitive process of attribution of responsibility (AR) was empirically studied to establish baseline AR data within the U.S. Army. In the experiment, two sections of 41, middle-grade, U.S. Army officers (captains, majors, and lieutenant colonels), attending the USACGSC were administered one of two AR questionnaires. The two questionnaires were constructed using 4 stories (2 with positive and 2 with negative outcomes) with five variations of each to represent the 5 levels of AR. One questionnaire was made up of purely military settings and the other was made up of purely civilian settings. Following past AR research, the stories included the minimum components necessary to elicit AR at each of the 5 levels. Story content was relevant to middle-grade military officers. AR varied significantly with Levels, Outcomes, Groups X Levels, Groups X Outcomes, and Outcomes X Levels ($p > .005$ or higher). The study supported past empirical tests of Heider's theoretical AR curve; based on the impact of environmental factors. However, the results very strongly supported the hypothesized decrement of AR at the 'Justifies' Level. This finding poses a higher level of AR maturity/sophistication in the present S population

than populations used in past AR research. The study further revealed a dualistic view of AR held by U.S. Army officers when presented with like situations in purely military and civilian settings. (Author)

PB-256 871/5GA PC$3.50/MF$3.00
California Univ., Irvine.
Indicators of the Responsiveness of Employment Systems to Workers' Needs and Values.
Final rept. Jul 73-Feb 76,
Robert Dubin. Apr 74, 15p ASPER/CON-73/0118/A
Contract DL-73-118

Descriptors: *Personnel management, *Adjustment(Psychology), Attitudes, Requirements, Incentives, Job satisfaction, Morale, Motivation, Psychological guidance, Fringe benefits, Social welfare.
Identifiers: Social indicators, Quality of worklife.

This paper sets forth some general criteria that social indicators of the quality of working life need to meet, indicates some specific criteria involving workers' needs and values, and makes some suggestions for the development of several possible social indicators. There are at least four important considerations involved in the development and use of social indicators: that the purposes of social indicators be kept in mind, that the reality being measured be acknowledged and understood, that values be specified that represent good and bad on the indicator, and that the possibility be taken into account that the social indicators employed will be an instrument for a 'self-fulfilling' prophecy. The criteria for judging workers' needs and values can be grouped into three classes. These are: personal safety and creature comfort, social and psychological well-being; and the worker-citizen nexus. The development of social indicators of the quality of working life from the standpoint of workers' needs and values is examined with respect to five separate topics: values surrounding work, opportunities for individual mobility, welfare redefinition, psychological freedom, and the worker as a consumer.

PB-257 354/1GA PC$10.75/MF$3.00
National Inst. on Alcohol Abuse and Alcoholism, Rockville, Md.
Proceedings of the Annual Alcoholism Conference of the National Institute on Alcohol Abuse and Alcoholism. Research on Alcoholism (1st), Held at Washington, D.C. on June 25-26, 1971. Clinical Problems and Special Populations.
Morris E. Chafetz. 1973, 387p NIAA/NCALI-76/19

Descriptors: *Alcoholism, *Meetings, American Indians, Research, Females, Adolescence, Human behavior, Pharmacology.
Identifiers: *Drinking drivers, *Drug abuse.

Proceedings of the First Annual Alcoholism Conference, sponsored by the National Institute on Alcohol Abuse and Alcoholism and reflecting some of the research priorities of that organization, are presented. Part I of the Conference was devoted to clinical research, and included separate sessions on medical complications of alcoholism, pharmacological considerations, and behavioral techniques in alcoholism treatment. In Part II, alcohol problems in special population groups were considered; at issue were the problems of American indians, youth, drinking drivers, and alcoholic women.

PB-257 355/8GA PC$9.00/MF$3.00
National Inst. on Alcohol Abuse and Alcoholism, Rockville, Md.
Proceedings of the Annual Alcoholism Conference of the National Institute on Alcohol Abuse and Alcoholism (2nd) Held at Washington, D.C. on June 1-2, 1972. Psychological and Social Factors in Drinking and Treatment and Treatment Evaluation.
Morris E. Chafetz. 1973, 256p NIAAA/NCALI-76/20

Descriptors: *Alcoholism, *Meetings, Human behavior, Psychology, Sociology, Adolescence, Therapy, Prevention, Evaluation, Criteria, Research, Tables(Data).
Identifiers: *Drug abuse, *Drug treatment programs.

Proceedings of the Second Annual Alcoholism Conference, sponsored by the National Institute on Alcohol Abuse and Alcoholism and reflecting both the progress in alcoholism research to date and the evolving research priorities, are presented. The papers evinced NIAAA's growing interest in investigations in the behavioral sciences, and in particular the development of workable and effective systems of alcoholism prevention. Part I focused on psychological and social factors, with specific reference to adolescent drinking and drinking problems and the relationship of alcohol to human motivation. In Part II treatment and treatment evaluation were considered, with separate sessions devoted to interpersonal and social treatment contexts, criteria in treatment evaluation, and the treatment process.

PB-257 424/2GA PC$6.75/MF$3.00
California Univ., Berkeley. Architecture Life Safety Group.
Mapping of Recurrent Behavior Patterns in Institutional Building Under Fire: Ten Case Studies of Nursing Facilities.
Final rept.,
Lars Lerup, David Greenwood, and John Sukjun Burke. Jul 76, 164p NBS-GCR-76-73
Contract NBS-5-9016

Descriptors: *Human behavior, *Fires, *Pattern recognition, Sequential analysis, Flame propagation, Correlations, Decision making, Dynamics, Drawings, Mapping.
Identifiers: *Building fires, Nursing homes, Case studies.

The report provides a graphical and narrative mapping of the fire and people behavior patterns in 10 institutional buildings under fire conditions. The case studies concentrate on nursing home type facilities. The report maps out the progress of the fire by realms of fire development and critical events separating these realms. A parallel mapping is included for human behavior covering the episodes and decisions involved. A conceptual framework and analysis of the basic concepts and approaches are included.

5K. Sociology

HRP-0007591/1GA Not available NTIS
Denver Univ., Colo. Center for Social Research and Development.
Rural Social Problems, Human Services, and Social Policies. Working Paper 10: Mental Health and Mental Retardation.
Janet Morton Derr. Sep 73, 27p
Grant SRS-9-56027
This document is related to HRP-0007590 and HRP-0007592 available from the University of Denver, CSRD, 2142 South High St., Spruce Hall, Rm. 21, Denver, Colorado 80210.
Available from the University of Denver, CSRD, 2142 South High St., Spruce Hall, Room 21, Denver, Colorado 80210, $1.00.

Descriptors: *Rural health services, Rural areas, Research, *Mental health care, Health care services, Health care requirements, Health care delivery.

Findings of a literature review with regard to mental health and mental retardation in rural communities are presented as one of a series of working papers on problems, services, and policies affecting rural populations. It is noted that the imbalance between mental health needs and mental health services in rural areas reflects the general problems that rural residents face in attempting to meet their human services need through community resources. Lack of community resources, physical and social isolation, and individual poverty combine to create obstacles to solving mental health problems as well as conditions which increase the probability that these problems will exist. While incidence of mental illness and mental retardation is the same or slightly higher in rural than in urban areas, the actual need for services is greater in rural areas because rural needs have accumulated over time due to lack of services. Efforts to expand rural mental health service delivery through comprehensive mental health center programs are noted, although by June 1969 only 10 percent of these centers were located in rural areas. Pilot projects, including investigations of the use of lay therapists and community consultation instead of direct services by professionals, also are noted. With regard to services for the mentally retarded, it is observed that the most available specialized services for these individuals from isolated rural areas is residential placement in State institutions.

HRP-0009107/4GA PC$5.00/MF$3.00
Social and Rehabilitation Service, Washington, D.C.
National Social Service Systems: A Comparative Study and Analysis of Selected Countries.
Dorothy Lally. Sep 70, 85p DHEW/SRS-76/05702

Descriptors: *Social sciences, Research, International relations, Health resources, Health related organizations, *Health care, *Health care delivery, Foreign countries, Economics.

The functions and organizational patterns of national social service systems in 32 countries are analyzed in a study undertaken to determine the extent to which these systems reflect the principles of the United Nations with respect to development, organization, and administration of social services. Major areas of national social service are described and analyzed in chapters dealing with national organization, priorities, nature and funding of social services, social work education and manpower, social welfare research and planning, and international cooperation. The primary emphasis is on the comparative aspects of the various systems. Case illustrations, selected from countries in which the United States has financed research and demonstration studies or has provided continuing technical cooperation, are provided. Among the major findings of the analysis are: the countries studied have moved ahead to establish separate departments at the national level for administration of social service programs; lack of specific legislation for departmental structure indicates that national social service agencies often may be subject to reorganization at the will of the executive; combined health and social service administration was found in every geographical region; the influence of United Nations principles on national organization has been considerable, most notably in the African countries; and the United Nations objective of ensuring availability of service on a nationwide basis has been achieved only to a limited extent. Implications of these and many other study findings are discussed, and areas for further research are suggested. A tabular summary of the major characteristics of social service organization and delivery in each country studied accompanies the text. A bibliography is included.

HRP-0009214/8GA PC$5.50/MF$3.00
California Univ., Los Angeles. Dept. of Economics.
Declining Birth Rates in Chile: Their Effects on Output, Education, Health, and Housing.
Bruce Herrick, and Ricardo Moran. Apr 72, 104p
Contract AID/csd-2611

Descriptors: Vital statistics, Sociology, Socioeconomic status, Socioeconomic factors, Methodology, Health care, Foreign countries, Economics, Economic studies, Demography, Data processing, Data analysis, Communities.

The effects of the declining birth rate in Chile on the gross national product (GNP) and on education, health, and housing services are explored within the theoretical framework of an economic - demographic model. The study has two objectives: (1) measurement of the impact of fertility change on aggregate and per capita GNP in Chile; and (2) appraisal of the probable impact of different levels of fertility and different rates of fertility change on required expenditures for education, health, and housing. The demographic and economic models employed are described in detail, and population, GNP, and physical and financial social service requirement projections are presented through the year 2000. The basic model is then extended to project effects of fertility change on educational attainment and, in turn, on the productivity of the Chilean labor force. The study report documents the extent to which fertility decline arrests the trend toward higher dependency rates, allows greater proportions of the population to participate in productive activities, leaves the growth of total GNP largely unaffected through increasing GNP per capita, and leads to substantial savings in the provision of social services or to the alternate possibility of substantial increases in their quality. It is observed that the approach used in the study and the consequences of differing rates of population growth are applicable to other developing countries, capitalist and socialist alike. Supporting tabular data, mathematical formulations, and a list of references are provided.

HRP-0009215/5GA PC$5.00/MF$3.00
General Electric Co., Santa Barbara, Calif. Center for Advanced Studies.
Economic Incentives: A Strategy for Family Planning Programs.
Bryan D. Hickman. Oct 72, 82p GE72TMP-33
Contract AID/CSD-2611

Descriptors: Vital statistics, Health care, *Health care utilization, Foreign countries, Fertility, Demography, Communities, Ambulatory health care.

A framework is presented within which the effects of incentives on fertility behavior and on utilization of family planning services can be systematically examined. Incentives are defined broadly as any economic inducements, especially financial payments, designed to change people's behavior with respect to family planning. The definition excludes noneconomic factors such as educational campaigns and social pressures that may affect behavior. Examples of incentives include bonuses for adopting a contraceptive method, for remaining nonpregnant, or for introducing new accepters of contraception; payments to physicians for patients served; subsidies for producing or distributing contraceptives; and tax advantages allowed to small families. The possible need for and role of incentives throughout the evolution of a family planning program are examined, and major incentive programs operating in low income nations as of October 1972 are described. A discussion of program goal specification and of problems typically encountered by family planning programs in less developed nations precedes the presentation of an analytical framework for determining the role of incentives. Criteria for designing incentive programs and incentive systems which have potential for meeting these criteria are described. Among the criteria are wide appeal to target populations, economic efficiency, administrative feasibility, protection against cheating, and political acceptability. The need for further experimentation in the area of family planning incentives is stressed. A bibliography is provided.

NTISUB/B/101-76/005
PC$15.00/MF$15.00
DUALabs, Arlington, Va.
Review of Public Data Use. Volume 4, Number 5, September 1976.
1976, 51p
See also NTISUB/B/101-76/004.
Paper copy also available on subscription, North American Continent price $60.00; all others write for quote. Individual articles available at $3.50/copy. Order by RPDU number.

Descriptors: *Demographic surveys, *Data sources, *Social sciences, Statistical data, Housing studies, Populations, Projects, Research, Models, Social change, Documents, Data acquisition, Health, Children, Computer programming.

This bimonthly journal, devoted to public data access and use, presents information on social science research and methodology, using publicly available data bases. The materials cover state and local government planning, computer programming, technical problems, legislation, and administrative actions. The current issue contains articles on: Log-linear models of change in class identification (RPDU-022); Data access news, and 1970 Census technical bulletins (RPDU-023); Estimation of housing and population data from electric meter records (RPDU-024); Social science and the collaborative perinatal project--an opportunity for research (RPDU-025).

PB-255 777/5GA PC$5.00/MF$3.00
NY-Penn Health Planning Council, Inc., Binghamton.
Community Profile Component NY-Penn Area Health Data Series,
James R. Tallon, Jr., and Daniel F. Creasey. Apr 73, 98p NCHSR-76/196
Contract PHS-HSM-110-71-255
Prepared in cooperation with NY-Penn Health Management Corp., Binghamton.

Descriptors: *Demographic surveys, Health planning, New York, Pennsylvania, Socioeconomic status, Demography, Geography, Characteristics, Census, Research, Tables(Data), New York, Pennsylvania, Populations, Statistical data.
Identifiers: *Susquehanna(Pennsylvania), *Community profiles, Appendices, *Broome County(New York), *Chenango(New York), *Tioga(New York), *Tioga(Pennsylvania), *Bradford(Pennsylvania).

The report describes the socio-economic, demographic, and geographic characteristics of the NY-Penn Region. Specific characteristics of the region as a whole are described. The unique characteristics of each of the region's five counties (Broome, Chenango, Tioga, Bradford, and Susquehanna) are next discussed. One appendix gives references used. The other gives criticism of the Cohort Survival Method of predicting population change. The remainder of the report consists of 55 tables containing basic information on the region and the counties for the census years 1950, 1960, and 1970.

PB-256 415/1GA PC$5.00/MF$3.00
Urban Inst., Washington, D.C.
The Impact of Demographic Change on the Distribution of Earned Income and the AFDC Program: 1975-1985.
Final rept. Jun 75-Apr 76,
Richard F. Wertheimer, II, and Sheila R. Zedlewski. 21 May 76, 100p ASPE/ISP-74-1
Grant DHEW/ASPE-014A-7501-P2021

Descriptors: *Social welfare, *Economic forecasting, *Federal assistance programs, Cost analysis, Social change, Demography, Populations, Family relations, Manpower, Sex, Income, Statistical inference, Manpower, Statistical distributions, Economic models.
Identifiers: Aid to families with dependent children, Female family heads, Labor force, Dynamic simulation of income model, Marriage rate, Divorce rate, Birth rate.

This paper forecasts costs and caseloads of the Aid to Families with Dependent Children (AFDC) program through 1985 under differing demographic and economic assumptions. As a by-product, forecasts for 1985 are made of the population, number of families, average family size, number of female-headed families, labor force by sex for persons and families, and distribution of family income by type of family. The Urban Institute Dynamic Simulation of Income Model (DYNASIM) is the major analytical tool. Major findings are that the growth of the AFDC caseload will depend crucially on the birth rate, marriage rate, and divorce rate, and may range between zero and 50 per cent depending on trends in family stability. The number of families with low incomes is highly sensitive to the divorce rate. The number of families headed by women is likely to grow under a wide range of assumptions.

PB-256 884/8GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Discussion.
Final rept.,
A. J. Goldman. 1970, 14p
Pub. in Proceedings of Symposium on Systems Analysis for Social Problems, Gaithersburg, MD, May 26-28, 1969. Paper in Systems Analysis for Social Problems, p93-103, Washington Operations Research Council, Washington, D.C. 1970.

Descriptors: *Urban sociology, Systems analysis, Urban planning, Housing studies, Fire protection, Urban development.

The increasingly solid quality of some recent applications of systems-analysis (SA) techniques to urban problems is noted. Particular emphasis is suggested on the city's success in performing those special functions for which it is peculiarly suited. The conflicting goals of and the struggle for scarce resources among urban interests are observed to be antithetical to SA's penchant for optimizing formulations; urban problems admitting such clean treatment are held unlikely to be among the underlying difficulties of cities, but may provide suitable starts for analysis. Concern is voiced that city institutionalization of SA may inhibit its search for bold solutions.

PB-257 152/9GA PC$7.50/MF$3.00
Florida State Univ., Tallahassee. Dept. of Economics.
Inequality in America: Research and Policy Perspectives on Race, Sex and Urban Development.
Final rept.,
Joan G. Haworth, and David W. Rasmussen.
Mar 76, 185p EDA/OER-76/023
Grant EDA-OER-415-G-72-11
Proceedings of a Conference held in Atlanta on May 14-16, 1975, sponsored by Economic Development Administration.

Descriptors: *Monority groups, *Discrimination, Employment, Earnings, Income, Females, Males, Negroes, Qualifications, Urban areas, National government, Government policies, Inequalities, Urban planning, Economic conditions.

Inequality in America is a major political and social issue that is unlikely to be quickly resolved. Emerging after World War II the issue has taken several forms. Until relatively recently the problem was viewed as primarily political in nature. The civil rights movement rose to reduce political inequality in America. But the issue of inequality was more deeply rooted. Its economic manifestations led to demands for better job opportunities for both minorities and women. The Economic Development Administration, U.S. Department of Commerce, supported a major research effort at Florida State University to analyze changes in the earnings, employment, and productivity of males and females. This analysis was conducted for whites, blacks, and other minorities. Of special interest to the EDA was the role cities play in the upward mobility of people since economic equality might be affected by location. Hence, a major part of the research effort addressed the relationship between economic welfare and city size.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A029 291/2GA PC$3.50/MF$3.00
Mount Sinai School of Medicine New York Dept of Medicine
Portal and Peripheral Vein Insulin Responses to Intravenous Glucose in the Rhesus Monkey,
Elliot J. Rayfield, Roy T. Faulkner, and William Czajkowski. 11 Jun 75, 7p
Availability: Pub. in Jnl. of Lab. and Clinical Medicine v87 n6 p919-924 Jun 76.

Descriptors: *Insulin, *Glucose, Response(Biology), Rhesus monkeys, Males, Secretion, Blood analysis.
Identifiers: Portal vein, Parenteral infusions, Reprints.

Catheterization of the portal vein and bilateral femoral veins were performed under general anesthesia in 6 healthy male rhesus monkeys. Four days later, sequential, simultaneous peripheral and portal plasma samples were obtained for glucose and immunoreactive insulin determinations before and after administration of 0.5 Gm. of glucose per kilogram (over a 1-minute period) via the opposite peripheral catheter. Two phases of insulin secretion were noted in both portal and peripheral plasma samples. An immediate early-phase insulin response was noted with a peak response at 1 minute followed by a rapid decline to a nadir at 5 minutes. A second phase of insulin secretion was evident with a peak response at 10 minutes and a subsequent decline to basal levels by 60 minutes. Simultaneous portal vein and peripheral vein glucose concentrations were not significantly different from each other by paired analysis. Thus, in the rhesus monkey peripheral insulin concentrations following intravenous glucose exhibit a biphasic response closely paralleling pancreatic insulin secretion. (Author)

AD-A029 474/4GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
The Effect of Bacterial Infections on Ketone Concentrations in Rat Liver and Blood and on Free Fatty Acid Concentrations in Rat Blood,
Harold A. Neufeld, Judith A. Pace , and F. Elizabeth White. 8 Sep 75, 8p
Availability: Pub. in Metabolism, v25 n8 p877-884 Aug 76.

Descriptors: *Bacterial diseases, *Ketones, *Fatty acids, Liver, Concentration(Chemistry), Rats, Blood analysis, Food deprivation, Mitochondria, Metabolites, Metabolism, Nutrition, Reprints.
Identifiers: Acetoacetates, Beta-hydroxybutyrate.

The concentrations of cytoplasmic lactate and pyruvate and the NAD(+)/NADH ratio and the concentrations of mitochondrial acetoacetate, beta-hydroxybutyrate, and the NAD(+)/NADH ratio were determined in normal, fed, and fasted rats, and in rats infected with Streptococcus pneumoniae, Francisella tularensis, and Salmonella typhimurium. The various infections were found to have little or no effect on the cytoplasmic parameters. In normal rats, fasting caused a marked increase in blood and hepatic ketone concentration and in serum free fatty acid content. Fasted infected rats, however, did not show the increase in ketone bodies or serum free fatty acids normally associated with fasting alone. Thee mitochondrial NAD(+)/NADH ratio increased as the infections progressed, reversing the normal trend. The introduction of an infection during the fasting state when ketone bodies and serum free fatty acids were elevated caused a marked depression in their concentration.

AD-A029 497/5GA PC$3.50/MF$3.00
Naval Medical Research Inst Bethesda Md
Enzymatic Activities of Cell-Free Extracts of 'Rickettsia typhi'.
Medical research programs rept.,
James C. Coolbaugh, Joseph J. Progar, and Emilio Weiss. 8 Mar 76, 10p
Availability: Pub. in Infection and Immunity, v14 n1 p298-305 Jul 76.

Descriptors: *Rickettsia typhi, *Enzymes, Biological extracts, Glycolysis, Glutamic acid, Reprints.
Identifiers: Tricarboxylic acid cycle, Malate dehydrogenase.

Cell-free extracts of Rickettsia typhi were tested for activities of enzymes of the tricarboxylic acid cycle, of glutamate catabolism, and of glycolysis. The following enzymatic activities were demonstrated: high levels of malate dehydrogenase (MDH), moderate levels of glutamate-oxaloacetate transaminase, glutamate, succinate, and isocitrate dehydrogenases, and citrate synthase, and low levels of glutamate-pyruvate transaminase. The specific activites of some of these enzymes were higher when the rickettsiae were harvested at a time of active proliferation, 3 to 4 days prior to embryo death. No activity was detected for glucose-6-phosphate, 6-phosphogluconate, glyceraldehyde-3-phosphate, lactate dehydrogenases, phosphoglucose isomerase, fructoaldolase, or pyruvate kinase. Results suggest that extracts of R. typhi that contain demonstrable enzymes involved in the catabolism of glutamate and tricarboxylic acid cycle intermediates, unlike Coxiella burneti, lack detectable glycolytic activity.

AD-A029 513/9GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Serum Lactate Dehydrogenase of Normal, Stressed, and Yellow Fever Virus-Infected Rhesus Monkeys,
Stephen K. Scott, Philip C. Kosch, and Duane E. Hilmas. 11 Mar 76, 7p
Availability: Pub. in Laboratory Animal Science v26 n3 p436-442 1976.

Descriptors: *Enzymes, *Yellow fever, Rhesus monkeys, Concentration(Chemistry), Laboratory animals, Reprints.
Identifiers: *Lactate dehydrogenase, Isoenzymes, *Viral diseases, *Infectious diseases.

Serum lactate dehydrogenase enzyme (sLDH) was studied in both healthy and yellow fever virus (YFV)-infected young adult rhesus monkeys (Macaca mulatta). In healthy monkeys, significant variation ($p < 0.001$) was observed for both total activity and isoenzyme distribution among the following comparisons: individual monkeys, different days, different times of day, and caged versus chair-restrained monkeys (until 7 da after chair restraint). However, variability of baseline values was reduced by the use of samples obtained from resting subjects at 9:00 am on at least 3 consecutive days. Normal total activity and isoenzyme distribution values were based on 148 determinations obtained from 73 healthy, caged monkeys. Both total activity and the proportion of the 5th isoenzyme fraction increased significantly ($p < 0.001$) in the YFV-infected monkeys, beginning 90 hr postinfection, consistent with hepatocellular necrosis and release of isoenzymes into the serum. The assay for sLDH appears to be of value as a diagnostic indicator during the course of YFV infection in the rhesus monkey. (Author)

PB-256 150/4GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Quantitative Determination of Total Organic Nitrogen and Isotope Enrichment in Marine Phytoplankton,
S. P. Pavlou, G. G. Friederich, and J. J. Mac Isaac. 27 Mar 74, 10p Contrib-727, NSF/IDOE-76-92
Grants NSF-GB-35880, NSF-GX-33502
Sponsored in part by Grant NSF-GA-31093-A1.
Pub. in Analytical Biochemistry, v61 p16-24 1974.

Descriptors: *Nitrogen, *Organic nitrates, *Phytoplankton, Chemical analysis, Quantitative analysis, Primary biological productivity, Aquatic biology, Plankton blooms, Isotopes, Ocean environments, Automation, Methodology, Manometers, Mass spectrometers.
Identifiers: Reprints.

The automated Dumas technique described by Barsdate and Dugdale for quantitative determination of total organic nitrogen and isotope enrichment in marine phytoplankton has been refined. The method involves manometric and mass spectrometric measurements for total nitrogen and nitrogen isotopes, respectively. Expressions for calculating isotope enrichment have been derived and include temperature, background, and ion pump corrections. The latter can be a major source of error in atom-percent enrichment calculations when ion pumps are used to maintain very low background pressures in the analyzer chamber. When such systems are adopted for 15N tracer analysis, calibration curves should be established prior to analysis to assess the level of interference. Copyright (c) 1974 by Academic Press, Inc.

PB-256 687/5GA PC$4.50/MF$3.00
General Electric Corporate Research and Development, Schenectady, N.Y.
Studies of Elastin as a Biomaterial: The Correlation of Surface Composition with Effects on Platelets and Clotting by Native, Altered and Reconstituted Elastin.
Annual rept. 1 Jul 75-30 Jun 76,
John F. Brown, Jr., John A. Bergeron, Henri P. M. Fromageot, James N. Groves, and George M. J. Slusarczuk. Jul 76, 68p SRD-76-090, NIH-N01-HB-4-2981
Contract N01-HB-4-2981
See also PB-248 763. Prepared in cooperation with New York State Dept. of Health, Albany. Div. of Labs. and Research.

Descriptors: *Proteins, Physicochemical properties, Pathology, Vascular diseases, Blood coagulation, Blood platelets, Surface chemistry, Physiology, Elastomers, Materials, Tables(Data), Adsorption, Arteriosclerosis.
Identifiers: *Biomaterials, *Elastins, *Blood compatible materials.

A variety of new observations on elastin swelling behavior, elastolysis kinetics, cytochrome permeation, adsorption of albumin, serum, and proteases, electrokinetic profiles, and surface morphology are presented. All appear rationalizable with views of elastin bulk structure as a paracrystalline array of 40-50A protofibrils and of the elastin surface as intrinsically hydrophobic and devoid of ionizable groups other than those arising from degradation. Two variants of alkali-cleaned elastin have now shown complete nonreactivity to platelets in tests with platelet-rich plasma, native whole rabbit blood, and perfused rabbit kidneys. The reconstitution of elastin from mixtures of elastin fibers and alpha-elastin by pressure-molding and dimethylcyanamide-curing has yielded compact sheets exhibiting the same ranges of modulus, elongation, and tensile strength (ca. 60 psi) as the original tissue elastin.

PB-256 789/9GA PC$3.50
California Univ., Davis. Inst. of Marine Resources.
Characterization of Myoglobins from Atlantic and Pacific Green Sea Turtles,
John D. Williams, Jr., and W. Duane Brown. 23 Jun 75, 8p NOAA-76060101
Grant NOAA-04-3-158-22
Pub. in Comparative Biochemistry and Physiology, v54B p253-259 1976.

Descriptors: *Turtles, *Aquatic animals, *Myoglobin, Reptiles, Vertebrates, Blood proteins, Chemical composition, Marine biology, Chemical properties, Purification, Biochemistry.
Identifiers: Reprints, Sea Grant program, Chelonia mydas mydas, Chelonia mydas caranigra.

The paper presents information on the isolation, purification, and characterization of myoglobins from two sub-species of green sea turtles, Chelonia mydas mydas (Atlantic) and Chelonia mydas caranigra (Pacific). Data presented include amino acid composition, extinction coefficients for a variety of derivatives, estimation of molecular weight by Sephadex chromatography and acrylamide gel electrophoresis, isoelectric points, extent of heterogeneity, and oxygen equilibria. Also included is a picture of a cross-section of muscle fibers stained for myoglobin.

PB-256 801/2GA PC$5.00/MF$3.00
California Univ., San Francisco. Dept. of Biochemistry and Miophysics.
Studies on the Molecular Basis of Collagen-Platelet Interaction and Synthesis of Peptides that will Inhibit this Interaction.
Annual rept. 30 Jun 75-30 Jun 76,
Dov Michaeli. Jul 76, 91p NIH-N01-HB-4-2984-2
Contract N01-HB-4-2984
See also PB-244 843.

Descriptors: *Platelets, *Collagen, *Peptides, *Blood coagulation, Assaying, Culture media, Serotonin, Chemical reactions, Chemical bonds, Molecular structure, Chemical analysis.
Identifiers: Synthesis(Chemistry), Biomaterials, Blood compatible materials.

A defined medium for platelets containing albumin HEPES buffer at pH 7.2 and 0.001 M zinc makes it now possible to assay platelet activity both in terms of serotonin release and in terms of aggregation at unprecedented high sensitivities. Platelets suspended in this medium react to collagen at 10 to the minus 9th power M. Such high sensitivities also made it possible to study the peptides obtained by CNBr cleavage of collagen in terms of their platelet activation capacity. These studies showed that the activity of collagen type I resides in two areas of the molecule: at the C-terminal end of the alpha 1 chain (CB6) and the alpha 2 chain (CB5), and at the end-terminal portion of the molecule (alpha 2CB4). A similar picture emerges when collagen type III, a vascular type collagen, is examined. Thus, alpha 1(III)CB9 which is the C-terminal end of a molecule is the most active peptide with respect to platelets.

PB-256 882/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Office of Standard Reference Materials.
Rationale for Reference Methods in Clinical Chemistry.
Final rept.,
J. Paul Cali. 1976, 9p
Pub. in Proceedings of Symposium of International Congress on Clinical Chemistry (9th), Toronto, Canada, July 13-18, 1975. Paper in Pure and Applied Chemistry, v45 p63-68 1976.

Descriptors: *Medical laboratories, *Chemical laboratories, Standards, Tests, Reliability, Quality control, Accuracy, Measurement, Chemical tests.
Identifiers: *Clinical chemistry, Reagents.

In the field of clinical chemistry evidence is mounting that a reliable and medically relevant structure can be built on the concept of compatibility through accuracy in measurement. By compatibility is meant the ability of all laboratories in a network to achieve on a given sample similar and reliable numerical values for a property under test. In order to build an accurate measurement network, three measurement methodology levels and three types of reference materials are required. A definitive method is directly able to realize or to have access to the base or derived unites of the measurement system. It depends in part on the availability of pure reference materials. At the next level are reference methods and matrix reference materials. These methods and materials are more adapted to implementation and use by clinical reference laboratories and the manufacturers of secondary reference materials. In turn these materials are used at the local level to control the quality and accuracy of the routine methods. How this hierarchy of methods and reference materials is structured is discussed.

6B. Bioengineering

AD-A029 178/1GA PC$3.50/MF$3.00
Naval Undersea Center San Diego Calif
A Technique for Rapidly Assessing the Hearing of the Bottlenosed Porpoise, 'Tursiops truncatus'.
Research rept. Jul 73-Dec 75,
R. L. Seeley, W. F. Flanigan, Jr., and S. H. Ridgway. Jul 76, 17p Rept no. NUC-TP-522

Descriptors: *Bioinstrumentation, *Hearing, Brain waves, Thresholds(Physiology), Porpoises, Test methods, Evoked responses.
Identifiers: Tursiops truncatus.

Brain-wave activity was used to determine approximate auditory 'threshold' levels for the unanesthetized bottlenosed porpoise (Tursiops truncatus) using a specially designed artifact inhibiting system. This technique can now be applied to rapidly (within 4 to 6 hours) estimate the hearing ability of T. truncatus over a frequency range of 5 kHz to 200 kHz to 200 kHz and could be employed to screen the hearing capabilities of other marine mammals. All equipment is portable and can be used in the field as well as in the laboratory. (Author)

AD-A029 432/2GA PC$5.50/MF$3.00
Colorado State Univ Fort Collins Surgical Lab
Monitoring Military Dogs by Biotelemetry.
Final rept.,
Harry A. Gorman. 30 Sep 74, 108p
Contract DADA17-72-C-2054

Descriptors: *Bioinstrumentation, *Telemeter systems, Monitoring, Dogs, Monitors, Field conditions, Response(Biology), Heart rate, Data acquisition, Data reduction, Electrodes, Blood pressure.
Identifiers: *Biotelemetry, *Military dogs.

A study was undertaken by the Surgical Laboratory at Colorado State University under a contract issued by the Research and Development Command of the United States Army to develop a telemetry package for monitoring trained scout dogs under field conditions and to study physiologic activity of these dogs in response to alerting on hidden quaries. A complete two channel telemetry system with one channel of physiologic data and one alert information channel was designed, built, and tested. The physiolcgy channel transmitted the electrical activity of the heart. The alert channel transmitted an alarm signal activated by a sitting alert position switch or by a redundant pull switch mechanism. The completed system included a transmitted and receiver alwet switching mechanisms, heart rate electrodes, antenna, receiver carrying pack, transmitter carrying saddle, and internal power supplies.

PATENT-3 962 697 Not available NTIS
Department of the Navy Washington D C
Low Level Bio-Telemetry System Using C/MOS Multiplexing.
Patent,
Robert Vreeland. Filed 16 Jun 75, patented 8 Jun 76, 8p AD-D002 907/4, PAT-APPL-587 172
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Telemeter systems, *Biomedical information systems, *Bioinstrumentation, *Patents, Complementary metal oxide semiconductors, Multiplexing, Electronic switching, Electronic switches, Low power.
Identifiers: *Biotelemetry, PAT-CL-340-183.

The patent relates to a low-power, transient-free, multi-channelled biotelemetry system which uses a series of C/MOS switches coupled to the data sampling electrodes. Shift register pulses selectively enable the switches to sequentially shift the data sample inputs through nine, switch-controlled channels. The switches have little battery drain and, due to their N and P complimentary arrangement, their gating pulses are effectively cancelled and removed from the system channels. Multiplexing precedes amplification by applying switch outputs to a single, low-power amplifier. A special pulse position modulator employing a ramp generator circuit provides the pulse trains to a keyed transmitter. Other significant improvements including a unique shift register arrangement with a synchronizing interval permit long periods of continuous operation undisturbed by the need for battery changes. The transmitted data is received by a suitable demodulating receiver to produce a recordable output for evaluation and computer analysis.

PB-256 961/4GA PC$5.00/MF$3.00
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
A Crossed Beam Doppler Ultrasound Concept for Improved Detection of Atherosclerosis.
Rept. for 1 Jun 75-31 May 76,
Martin D. Fox. 15 Jun 76, 87p NIH-N01-HV-5-2963-1
Contract N01-HV-5-2963

Descriptors: *Arteriosclerosis, *Ultrasonic radiation, Acoustic detection, Images, Cardiovascular diseases, Vascular diseases, Doppler systems, Blood flow, Diagnosis, Sonar transducers, Medical equipment, Computer programming.

Identifiers: Noninvasive tests, *Diagnostic equipment, Medical computer applications.

Initial work has been undertaken to design and carry out a program of development and evaluation of a crossed beam continuous wave Doppler and B-scan ultrasound imaging system aimed at noninvasive detection, quantification and visualization of atherosclerotic lesions and associated modifications in blood flow. Extensive computer calculations were carried out to determine the optimum dimensions for the required transducer array. Concepts were developed for electronic control of array phasing and computer software and interfacing. Initial fabrication, assembly and checkout of prototype components has been performed. Preliminary results indicate that the crossed beam flowmeter is highly linear over a wide range of flow velocities.

6C. Biology

AD-A029 306/8GA PC$3.50/MF$3.00
School of Aerospace Medicine Brooks AFB Tex
Outbreak of Staphylococcal Infections in Postoperative Primates,
Louis E. Blouse, Royce M. Brockett, Paul J. Homme, and Earl F. Jones. 23 Sep 75, 5p Rept no. SAM-TR-75-367
Availability: Pub. in American Jnl. of Veterinary Research, v37 n6 p731-733 Jun 76.

Descriptors: *Staphylococcus aureus, Signs and Symptoms, Epidemiology, *Laboratory Animals, Rhesus monkeys, *Veterinary medicine, Strains(Biology), Reprints.
Identifiers: Postoperative infection, Primates, Bacterial diseases.

In late October 1974, a Staphylococcus aureus postoperative wound infection was recorded in a primate which had recently undergone surgery at the Veterinary Sciences Division, Brooks AFB, Texas. A second case was noted approximately two weeks later, followed by a clustering of six cases over the next three-week period. The clinical spectrum included two septicemias and a number of superficial skin infections at surgical incision sites. Investigation revealed a uniform and consistent association of a phage Group II S. aureus strain designated 3A/55/71. This strain was also found to be endemic among other postoperative primates sharing or having shared a common Postsurgical Care Unit with infected primates. Epidemiologic findings suggested the introduction of this unusually virulent S. aureus strain occurred via an infected primate which underwent surgery in October, and that additional cases were most probably due to subsequent primate-to-primate transmission. Appropriate measures were instituted for the control and prevention of further infections. (Author)

AD-A029 309/2GA PC$3.50/MF$3.00
California State Univ Long Beach Dept of Biology
Circadian Activity Rhythm in the Horn Shark, 'Heterodontus francisci': Effect of Light Intensity.
Technical rept.,
William O. Finstad, and Donald R. Nelson. 23 Jan 74, 11p Rept no. TR-9
Contracts N00014-75-C-0204, N00014-68-C-0318
Availability: Pub. in Bulletin of the Southern California Academy of Sciences, v74 n1 p20-26 Apr 75.

Descriptors: *Sharks, *Circadian rhythms, Behavior, Light, Darkness, Nocturnal animals, Reprints.
Identifiers: Heterodontus francisci.

Activity onsets of horn sharks, Heterodontus francisci, were studied in the natural environment at Santa Catalina Island, California. The mean of activity onsets of these nocturnal sharks occurred 76 min. after sunset which corresponded to an approximate light level of 0.03 lux. During laboratory studies under a fixed LD 12:12 (12 hr. light - 12 hr. dark) regime, the L phase of which was 8 lux, H. francisci showed anticipation of the D phase. Under 23 days of constant dim light, H. francisci exhibited a drifting circadian rhythm with period lengths, for one individual, of 20.8 hr. under 2.0 lux, and 23.0 hr. under 0.13 lux. Under 15 days of constant darkness, the sharks showed a high level of aperiodic activity. During laboratory experimental dusk transitions, the light intensity eliciting onset of activity was: (1), proportional to the amount of time sharks spent in the L phase of the LD regime, and (2), independent of the level of light during the L phase of the LD regime. (Author)

AD-A029 421/5GA PC$3.50/MF$3.00
Naval Medical Research Unit No 5 Apo New York 09319
Bird-Ringing in Ethiopia Report Number 5, 1969-1975.
Technical rept.,
John S. Ash. 6 Jan 76, 19p Rept no. NAMRU-5-TR-01

Descriptors: *Birds, *Migration, Disease vectors, Rings, Recovery, Ecology, Ethiopia.
Identifiers: *Bird banding.

The 'top-ten' species in numbers ringed for all years, in descending order, are: Mourning Dove, White-vented Bulbul, Flava Wagtail, Willow Warbler, African Sand Martin, Red-billed Firefinch, Black-headed Weaver, Swallow, Northern Masked Weaver, and Reed Warbler, which together comprise 26% of the grand total ringed. It is of interest that four species of Palearctic migrants are included. Only 18 new species were added to the ringing list this year. (Author)

AD-A029 468/6GA PC$3.50/MF$3.00
California State Univ Long Beach Dept of Biology
Hearing Thresholds of the Horn Shark, 'Heterodontus francisci'.
Technical rept.,
Joseph C. Kelly, and Donald R. Nelson. 27 Dec 74, 8p Rept no. TR-10
Contracts N00014-75-C-0204, N00014-68-C-0318
Availability: Pub. in Jnl. Acoustical Society of America v58 n4 p905-909 Oct 75.

Descriptors: *Sharks, *Hearing, Bioacoustics, Behavior, Audiometry, Thresholds(Physiology), Conditioning(Learning), Auditory perception, Reprints.
Identifiers: Heterodontus francisci.

Horn sharks were conditioned to pure-tone audio signals in two different laboratory test situations. In the first experiment, conducted in a small, air-speaker-driven enclosure, four sharks were conditioned to cross a barrier to avoid electrical shock. The sharks responded from 25 to 160 Hz, with the lowest pressure threshold at 40 Hz. The second experiment, conducted in a large tank with an underwater speaker, used four different sharks and employed a heart-rate technique in which shock and sound were paired to elicit conditioned bradycarida. These sharks responded over a similar frequency range of 20 to 160 Hz. When tested at two subject-to-transducer distances, their acoustic pressure thresholds increased with distance while their acoustic particle-motion thresholds remained the same.

AD-A029 511/3GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Class Arachnida.
Technical scientific rept.,
Harry Hoogstraal. 1976, 22p Rept no. NAMRU-3-TR-15-76
Availability: Pub. in Tropical Medicine, 5th ed p712-729 1976.

Descriptors: *Arachnids, *Bites and stings, Lesions, Arthropoda, Disease vectors, Taxonomy, Tropical medicine, Venoms, Signs and symptoms, Ticks, Spiders, Mites, Diseases, Skin(Anatomy), Reprints.
Identifiers: Scorpions.

Medically important arthropods. The primarily terrestrial ARACHNIDA are chelicerate arthropods lacking antennae, mandibles and wings. The head and thorax are fused and most adults have four pairs of legs. Five of the 11 subclasses -SCORPIONES, UPOPYGI, ARANEAE, SLIFUGAE and ACARI--- are considered in this report. (Author)

AD-A029 647/5GA PC$3.50/MF$3.00
Army Medical Intelligence and Information Agency Washington D C
Culex - A New (Mosquito) Species,
Quing-Hua Meng. 25 Aug 76, 10p Rept no. USAMIIA-K-6092-A
Trans. of report from Biological Study Section of the Gui Yang Medical Institute (Mainland China) 1957.

Descriptors: *Culex, Anatomy, Entomology, Larvae, Translations, China.
Identifiers: Culex fatigans, Culicidae.

Contents: Male mosquito; Female mosquito; The mature larva; and Type specimens.

AD-A029 648/3GA PC$3.50/MF$3.00
Army Medical Intelligence and Information Agency Washington D C
Anopheles Freyi,
Quing-Hua Meng. 25 Aug 76, 6p Rept no. USAMIIA-K-6092-B
Trans. of report from Biological Study Section of the Gui Yang Medical Institute (Mainland China) p31-36 1957.

Descriptors: *Anopheles, Anatomy, Entomology, Taxonomy, Larvae, Females, Translations, China.
Identifiers: *Anopheles freyi, Culicidae.

Contents: Anopheles freyi; Female mosquito; and The mature larva.

E76-10458 PC$4.00/MF$3.00
Alaska Univ., College.
Use of LANDSAT Imagery for Wildlife Habitat Mapping in Northeast and Eastcentral Alaska.
Progress rept. no. 4,
A. J. LaPierriere. 20 Aug 76, 32p NASA-CR-148589
Contract NAS5-20915
Prepared in cooperation with Alaska Cooperative Wildlife Research Unit, College.

Descriptors: *Habitats, *Alaska, Vegetation, Summer, Winter, Wildlife, Forests, Tundra, Earth Resources Program, Image contrast, Multispectral band scanners.

The author has identified the following significant results. Indications are that Alaskan scenes dated later than about September 5th are unsuitable for vegetational analyses. Such fall data exhibit a limited dynamic range relative to summer scenes and the informational content of the data is reduced such that discrimination between many vegetation types is no longer possible.

PB-256 426/8GA PC$4.00
San Diego State Univ., Calif. Center for Marine Studies.
Use of Thermal Effluent in Culturing the American Lobster,
Jon C. Van Olst, Richard F. Ford, James M. Carlberg, and Wayne R. Dorband. Nov 75, 28p Contrib-13, NOAA-76051306
Grant NOAA-04-3-58-122
Sponsored in part by San Diego Gas and Electric Co., Calif. and Southern California Edison Co., Redondo Beach. Pub. in Power Plant Waste Heat Utilization in Aquaculture - Workshop I, Trenton, N.J., 6-7 Nov 75 p71-97 1976.

Descriptors: *Lobsters, *Cooling water, *Aquaculture, Electric power plants, Thermal environments, Sea water, Crustacea, Growth, Eggs, Survival, Concentration(Composition), Toxicity, Bioassay, Temperature, Fossil fuels, Coasts, California.
Identifiers: Sea Grant program, Homarus americanus.

Comparative water quality analyses, tissue analyses, toxicity studies and rearing experiments are being conducted to assess the benefits and problems in using thermal effluent from typical coastal generating stations to culture the American lobster, Homarus americanus, from the egg to market size. No significant differences due to chemicals were observed in mean concentrations of Cu, Zn, Cd, Co, Cr, and Pb, in whole-body tissues of juvenile and adult lobsters maintained in three water types. Growth and survival of larval and juvenile lobsters maintained in a series of short and long-term bioassay experiments at constant temperatures of 18.5 and 22C were not significantly different in the effluent water at Encina and in the Encina intake and Scripps water sources. All of these studies indicate that the thermal effluent from typical fossil fuel generating stations in southern California provides a suitable heated water source for the culture of Homarus americanus.

PB-256 719/6GA PC$3.50
Michigan Univ., Ann Arbor. Sea Grant Program.
Historical Changes in Mercury Contamination in Michigan Walleyes ('Stizostedion vitreum vitreum'),
T. M. Kelly, J. D. Jones, and G. R. Smith. 4 Jun 75, 12p MICHU-SG-76-300, NOAA-76051104
Pub. in Jnl. of Fisheries Research Board of Canada, v32 n10 p1745-1754 1975.

Descriptors: *Fresh water fishes, *Mercury(Metal), *Water pollution, Concentration(Composition), History, Correlation techniques, Weight(Mass), Muscles, Chemical properties, Variations, Age, Size determination, Michigan.
Identifiers: Reprints, Sea Grant program, Stizostedion vitreum.

Mercury concentrations in Michigan walleyes (Stizostedion vitreum vitreum) are more variable among localities than between recent and historical samples within localities. Methods for validly comparing preserved and fresh specimens were established by tests to determine the weight loss through dehydration in preservation. In 74% alcohol, muscle tissue of medium to large walleyes dehydrates to about 70% of the fresh weight in the first year. Mercury concentration in walleye muscle from recent and old museum collections is positively correlated with age and size. Considerable variation in concentration exists not only between geographic localities, but within populations, and even within subsamples of the same tissue.

PB-256 741/0GA PC$3.50
Louisiana State Univ., Baton Rouge. Dept. of Food Science.
Experimental Flake Diets for Fish and Crustacea,
Samuel P. Meyers, and Christopher W. Brand. Apr 75, 7p LSU-R-75-007, NOAA-76042103
Grant NOAA-04-3-158-19
Pub. in The Progressive Fish-Culturist, v37 n2 p67-72 Apr 75.

Descriptors: *Fish protein concentrates, *Diets, *Fishes, *Crustacea, Animal nutrition, Food processing, Seafood, Aquatic biology, Food analysis, Binders, Feeding stuffs, Flaking, Food composition, Tables(Data).
Identifiers: Reprints, Sea Grant program.

In this article are discussed the efforts being conducted to develop a fish food product for fish and crustacea. This fish food would consist of a flake diet that would contain the proper nutrition for healthy fish development.

PB-256 744/4GA PC$3.50
Louisiana State Univ., Baton Rouge. Dept. of Marine Science.
Population Dynamics of Two Species of Commercial Shrimp in Caminada Bay, Louisiana,
A. L. Crowe. Dec 75, 8p LSU-R-76-006, NOAA-76051001
Pub. in Proceedings of the Louisiana Academy of Science, v38 p86-91 Dec 75. Report on Sea Grant program.

Descriptors: *Shrimps, *Caminada Bay, Population(Statistics), Salinity, Abundance, Temperature, Marshes, Detritus, Sea grasses, Animal behavior, Louisiana.
Identifiers: Reprints, Sea Grant program, *Penaeus setiferus, *Penaeus aztecus, Commercial fishing.

The population dynamics of 2 commercial species of shrimp were studied at 6 trawl stations in Caminada Bay, Louisiana, from Caminada Pass to south of Little Lake from May 1971 to November 1972. The salinity range in which the greatest numbers of juvenile Penaeus setiferus (91.9%) were caught was 1-20 ppt, while 91.8 percent of juvenile P. aztecus occurred at salinities between 10-30 ppt. P. setiferus were frequently caught in temperatures below 20C while the majority of P. aztecus were caught at temperatures greater than 20C. P. aztecus and P. setiferus occupy the marsh at different seasons of the year corresponding to distinct pulses in the amount of detrital material from Spartina sp. reaching the water.

PB-256 745/1GA PC$3.50
Michigan Univ., Ann Arbor. School of Natural Resources.
Relation Between Yield and Fishing Mortality for Ricker's Yield Equation,
A. L. Jensen. 14 Oct 75, 5p NOAA-76051109
Sponsored in part by National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant. Pub. in Jnl. of the Fisheries Research Board of Canada, v33 n2 p275-277 1976.

Descriptors: *Fresh water fishes, *Mortality, *Fishing, *Muskellunge Lake, Equations, Abundance, Yield, Mathematical models, Indiana, Canada.
Identifiers: Reprints, Sea Grant program, Lepomis macrochirus.

A method is presented that can be applied to examine the relation between yield and magnitude of fishing mortality for Ricker's dynamic pool yield equation. The magnitude of fishing mortality is measured by the norm of the vector of interval specific instantaneous fishing mortality coefficients. The method is applied to bluegill sunfish (Lepomis macrochirus) population.

PB-256 788/1GA PC$3.50
Mississippi State Univ., Mississippi State. Dept. of Zoology.
Proximate Nutritive Value Changes During Decomposition of Salt Marsh Plants,
Armando A. de laCruz. 26 Feb 74, 7p MASGP-76-012, NOAA-76052701
Grant NSF-GA-35715
Sponsored in part by Mississippi-Alabama Sea Grant Consortium, Ocean Springs, Miss. Grant NOAA-2-35362. Pub. in Hydrobiologia, v47 n3-4 p475-480 1975.

Descriptors: *Marshes, *Aquatic plants, Grasses, Salinity, Nutritive value, Decomposition, Proteins, Carbohydrates, Fats, Calorific value, Detritus, Mississippi.
Identifiers: Reprints, *Salt Marshes, Spartina cynosuroides, Distichlis spicata, Scirpus americanus.

Recognition of salt marsh plant detritus as a nutritious source of food for estuarine consumers prompted investigation of in situ decomposition and proximate nutritive values of three plants and their detritus namely: Spartina cynosuroides and Distichlis spicata (Gramineae) and Scirpus americanus (Cyperaceae) growing abundantly in Mississippi tidal marshes. During decomposition to particulate detritus, these plants retain 60-70% organic content and the caloric value either remains the same or increases slightly. Crude fiber, carbohydrate, and fat contents decline but protein shows 96-300% increase from dead plants to particulate detritus stage.

PB-256 907/7GA Not available NTIS
San Diego State Univ., Calif. Dept. of Physical Science.
Fish-Bone Oil: Percent Total Body Lipid and Carbon-14 Uptake Following Feeding of 1-14 C-Palmitic Acid,
C. F. Phleger, J. Patton, P. Grimes, and R. F. Lee. 20 Oct 75, 5p NSF/IDOE-76-148
Prepared in cooperation with Skidaway Inst. of Oceanography, Savannah, Ga., and Scripps Institution of Oceanography, La Jolla, Calif.
Pub. in Marine Biology, International Jnl. on Life in Oceans and Coastal Waters, v35 n1 p85-89 1976.

Descriptors: *Fishes, *Lipids, *Bones, Marine fishes, Diet, Metabolism, Deposits, Glycerides, Biochemistry.
Identifiers: Reprints.

Bones contain the majority of body lipid in some marine fish. In the sheepshead wrasse Pimelometopon pulchrum and the sablefish Anoplopoma fimbria, the bone lipid comprised 79 to 93% and 52 to 82% of the total body lipid, respectively. The senorita Oxyjulus california, another species of wrasse, has only 14% of its body lipid in bone. To determine whether dietary lipid is deposited quickly in the bone lipid, three species of fish were fed 1-14C-palmitic acid. Radioactivity appeared in the bone lipid as soon as 12 h after feeding, with the species rich in bone lipid incorporating the highest activity relative to the flesh. Roughly 80% of the radioactivity recovered in A. fimbria bone lipid was found in triglyceride. Radioactivity was equally distributed between phospholipid and triglyceride in P. pulchrum bone lipids. The results suggest that in some marine fish the bones contain the majority of the organism's reserve energy. Copyright (c) by Springer-Verlag 1976.

PB-256 980/4GA MF$3.00
National Institutes of Health, Bethesda, Md.
Proceedings of the National Conference on Research Animals in Medicine, Held at Washington, D.C., on January 28-30, 1972.
2 Oct 73, 1243p DHEW/PUBL/NIH-72/333
Paper copy available from GPO PC$14.65.

Descriptors: *Laboratory animals, Animal husbandry, Animal diseases, Surgery, Medical equipment, Zoonoses, Veterinary medicine, Animal physiology, Anesthesiology, Pharmacology, Research and development, Surgical transplantation, Cardiology, Respiratory system, Animal nutrition, Radiation effects.
Identifiers: *Medical research, Animal models.

Included are over 100 papers presented at the Conference. The following subjects were covered: Animal models simulating various cardiac, pulmonary, and systemic diseases; test-animal requirements for cardiopulmonary research and development activities; current surgical techniques in animals, especially cardiovascular surgery and organ transplantation, including preoperative care and preparation, techniques of anesthesia, and immediate and chronic postoperative care; equipment and techniques for monitoring respiratory and cardiac functions, circulatory dynamics, and other physiological functions in animals; pharmacology of anesthetics, cardiac drugs, and other agents in mammals, particularly ruminants and carnivores, and genetic and biologic effects of irradiation on large animals; prevention and management of common disease problems of large research animals.

PB-256 986/1GA Not available NTIS
Washington Univ., Seattle.
Analysis of Threshold-Induced Bias Inherent in Acoustic Scattering Cross-Section Estimates of Individual Fish,
R. T. Weimer, and J. E. Ehrenberg. 16 May 75, 7p NSF/IDOE-76-77
Contract NOAA-03-4-208-210, Grant NOAA-04-5-158-48
Pub. in Jnl. of the Fisheries Research Board of Canada, v32 n12 p2547-2551 1975.

Descriptors: *Fishes, *Acoustic detection, *Echo sounding, Surveys, Deep scattering layers, Acoustic scattering, Underwater acoustics, Scattering cross sections, Bias, Estimates, Assessments, Canada.
Identifiers: Reprints, International Decade of Ocean Exploration.

During acoustic fish stock assessment surveys, it is often desirable to measure the distribution of the acoustic scattering cross-section of single fish. One of the problems in such measurements is that a threshold in the electronic circuitry discriminates against small fish. This effect is analyzed in detail, and an expression is derived for the threshold-induced bias in the mean scattering cross-section estimate. Results are plotted for a typical set of operating conditions.

PB-257 078/6GA PC$6.00/MF$3.00
Iowa Cooperative Fishery Unit, Ames.
A Study of the Effects of Stream Channelization and Bank Stabilization on Warmwater Sport Fish in Iowa: Subproject No. 3. Some Effects of Short-Reach Channelization on Fishes and Fish Food Organisms in Central Iowa Warm Water Streams.
Final rept.,
Laurence Robert King, and Kenneth D. Carlander. Apr 76, 226p FWS/OBS-76/13
Contract DI-14-16-0008-745
See also PB-257 079.

Descriptors: *Channel stabilization, *Bank protection(Waterways), *Freshwater fishes, *Stream erosion, *Vegetation, *Iowa River, Channels(Waterways), Dissolved gases, Oxygen, Benthos, Feeding stuffs, Beaver Creek, Geomorphology, Turbidity, Stream flow, Plankton, Construction, Food habits, Black Hawk Creek, Tipton Creek, Honey Creek, Iowa.
Identifiers: Sport fishing, *Reach(Streams).

Six central Iowa streams were studied in 1974 to determine whether fish and fish food organisms were affected by short-reach channelization associated with bridge replacement in the last 15 years. In all cases the streams had been previously modified in the original bridge construction. The recent construction involved loss of 151 to 429 m of stream length in three streams and in the other streams the new channel was the same length as before. This would involve a loss of up to 18% of the stream if a bridge were built on each section line. Downstream the channel was narrower and shallower and perhaps had less brush shelter than upstream from the channel. Brush shelter was lacking in 2 of the 3 streams channelized in the last 2 years but had recovered somewhat, but not completely, in those channelized 10-15 years earlier. There was no evidence that dissolved oxygen, turbidity, or stream macroinvertebrates as measured by core, drift or artificial substrate samples differed upstream, in the channel, or below. The most evident impact of short-reach channelization is the removal of cover in the altered area and the loss of stream length.

PB-257 079/4GA PC$5.00/MF$3.00
Iowa Cooperative Fishery Unit, Ames.
A Study of the Effects of Stream Channelization and Bank Stabilization on Warmwater Sport Fish in Iowa: Subproject No. 4. The Effects of Longreach Channelization on Habitat and Inverterbrate Drift in Some Iowa Streams.
Final rept.,
David William Zimmer, and Roger W. Bachmann. May 76, 94p FWS/OBS-76/14
Contract DI-14-16-0008-745
See also PB-257 078.

Descriptors: *Channel stabilization, *Bank protection(Waterways), *Fresh water fishes, *Des Moines River Basin, Gradients, Channels(Waterways), Invertebrates, Diptera, Arthropoda, Biomass, Velocity measurement, Stream flow, Depth, Environmental impacts, Windward drift, Abundance, Iowa, Tables(Data).
Identifiers: Sport fishing, *Reach(Streams), Channel morphometry.

Relationships between channel morphometry, habitat diversity, and invertebrate drift density were studied in 11 natural and channelized stream segments of the upper Des Moines River Basin during 1974 and 1975. Gradients of the study sites ranged from 0.17 to 2.18 m/km; sinuosity index values were between 0.95 and 1.67. The most obvious effect of channelization on stream habitat was a reduction in the diversity of water depth and current velocity. There was a significant ($P=.05$) positive correlation between channel sinuosity and the variability of stream depth and velocity. Invertebrate drift density, expressed as biomass and total counts, was also correlated with channel sinuosity. Sinuous streams had greater concentrations of drifting organisms than did straight channels.

PB-257 080/2GA PC$4.50/MF$3.00
Montana Cooperative Fishery Unit, Bozeman.
Evaluation of Stream Channelization and Mitigation on the Fishery Resources of the St. Regis River, Montana.
Final rept. Jul 73-Jul 76,
John A. Lund. Jun 76, 59p FWS/OBS-76/07
Contract DI-14-16-0008-737

Descriptors: *Channel improvements, *Stream flow, *Fishes, *Geomorphology, *Saint Regis River, Construction, Soil erosion, Channel stabilization, Losses, Mapping, Turbidity, Jetties, Population(Statistics), Trout, Summer, Montana.

Stream morphology and gamefish populations of the St. Regis River, Montana were studied during the summers of 1973, 1974 and 1975 to determine the effects of stream channelization caused by highway (Interstate 90 and U.S. 10) and railroad construction. In-stream structures used to mitigate fish losses were also evaluated. Population estimates were made using electrofishing methods on unaltered, altered, altered with mitigating structures, and 'old' altered study sections. Physical parameters of each section were mapped to show differences between altered and unaltered sections. Results of the study show that mitigating structures (jetties and random rock clusters) were effective in providing fish habitat comparable to unaltered sections.

PB-257 214/7GA PC$4.50/MF$3.00
North Carolina Div. of Marine Fisheries, Morehead City.
Nursery Area Survey of Northern Pamlico Sound and Tributaries.
Completion rept. 1 Jul 74-30 Sep 75,
Connell Purvis. Apr 76, 66p NOAA-76060307
See also report dated Nov 74, COM-75-10090.

Descriptors: *Fisheries, *Estuaries, *Pamlico Sound, Surveys, Aquaculture, Crustacea, Fishes, Invertebrates, Shellfish, Tables(Data), Shrimps, Crabs, Flatfishes, Reproduction(Biology), Fishing grounds, Maps, North Carolina.
Identifiers: *Finfishes, Fish economics.

A project was inititated in northern Pamlico Sound, North Carolina, to identify nursery areas for economically-important species of finfish and crustaceans. During the 12-month study period from July, 1974, through June 1975, a total of 709 samples was collected. Fifty-five species of finfish and seven species of invertebrates were taken. Twenty species of finfish and four species of invertebrates were considered to be of economic importance. Nursery areas were designated on maps for five species of finfish (menhaden, weakfish, spot, croaker, southern flounder) and three species of invertebrates (brown shrimp, white shrimp, blue crab).

PB-257 231/1GA PC$3.50/MF$3.00
Maine Univ., Walpole. Ira C. Darling Center for Research, Teaching and Service.
Oyster Culture in Maine Specifications and Approximate Costs of Rearing Equipment.
Maine Sea Grant information leaflet,
Mark S. Richmond. Aug 74, 10p MSGI Leaflet-5, NOAA-76060207
Prepared in cooperation with Department of Agriculture, Washington, D.C.

Descriptors: *Oysters, *Aquaculture, *Crustacea, Specifications, Cost analysis, Equipment, Shellfish, Growth, Reproduction(Biology), Maine.
Identifiers: Sea Grant program, Fishing equipment.

The report specifically deals with aquaculture rearing equipment. Included are the costs of some culture facilities along with illustrations of a few different models used in aquaculture. The analysis has been broken into three categories: (1) Shellfish seed; (2) Marine supplies and related hardware; and (3) Descriptions of shellfish growing units.

PB-257 242/8GA PC$3.50
Michigan State Univ., East Lansing. Dept. of Fisheries and Wildlife.
Salmon Eggs: Bait and Food,
Peter Tack. May 76, 5p NOAA-76061503
Pub. in Extension Bulletin E-960, Natural Resources Series, May 76.

Descriptors: *Salmon, *Eggs, *Food, Aquaculture, Removal, Food consumption, Borax, Food processing.
Identifiers: Sea Grant program, Caviar, Fish bait.

The article gives information on the proper procedure of removing fish roe immediately after a catch. The article also includes information on how to prepare caviar as well as preserving them in Borax preservation. Fresh eggs can also be used for bait if they fail to be suitable for human consumption.

PB-257 250/1GA PC$3.50/MF$3.00
Maine Univ., Walpole. Ira C. Darling Center for Research, Teaching and Service.
Fishing Business Management.
Maine Sea Grant information leaflet,
Frederick J. Smith. Mar 75, 25p MSGI Leaflet-8, NOAA-76060206
Grant NOAA-NG-40-72
Prepared by Oregon State Univ., Corvallis. Dept. of Agricultural Economics.

Descriptors: *Fishing, *Fisheries, *Economic analysis, Profits, Income, Financing, Investments, Taxes, Budgeting, Marketing, Efficiency.
Identifiers: Sea Grant programs, Commercial fishing.

The report gives information on the business aspects of the fishing industry. It consists of a series of five readings that aim to help the fisherman maximize his profits. The readings are as follow: Maximizing Your After-Tax Income; Understanding Your Financial Strengths and Weaknesses; Analyzing Your Return to Investment and Your Time; Increasing the Accuracy and Efficiency of Your Decisions; Organizing Your Business for Maximum Financial Advantage.

PB-257 251/9GA PC$4.00/MF$3.00
Alaska Univ., College. Inst. of Marine Science.
Selected References to the Genus 'Chionoecetes',
J. R. Hilsinger. Feb 76, 30p IMS-R76-2, Sea Grant-76-4, NOAA-76060113
Grant NOAA-04-5-158-35

Descriptors: *Crabs, *Bibliographies, Shellfish, Fisheries, Animal behavior, Food processing, Continental shelves, Marine biology, Alaska.
Identifiers: Sea grant program, *Chionoecetes, Snow crab.

The following references deal in whole or in part with the members of the genus Chionoecetes. The references cover all aspects of snow crab biology, fisheries, and food processing technology. The particular species dealt with in each article, where known, is listed at the end of the citation if not included in the title.

PB-257 253/5GA PC$3.50/MF$3.00
Alaska Univ., College. Inst. of Marine Science.
Enhancement of Primary Productivity by Artificial Upwelling.
Technical rept.,
R. A. Neve, R. C. Clasby, J. J. Goering, and D. W. Hood. May 76, 25p Sea Grant-76-8, NOAA-76061409
Grant NOAA-04-6-158-44039

Descriptors: *Primary biological productivity, *Upwelling, *Aquaculture, Ponds, Feasibility, Pumping, Nutrients, Biomass, Plankton, Growth, Inorganic nitrates, Alaska.
Identifiers: Sea Grant program, *Artificial upwelling.

A model aquaculture pond system has been developed to test the feasibility of using artificial upwelling to enhance primary productivity in Alaskan impoundments. Deep nutrient rich water was pumped into an experimental pond and plankton growth in this pond compared to a control pond supplied with surface water. Standing stock and rates of primary productivity in the experimental pond were increased as much as five fold over that of the control. The primary factor controlling growth rates in the ponds was the amount of incoming nutrients, primarily nitrate. The data show that with a consistently good nutrient source artificial upwelling can be used in aquaculture systems in Alaska.

PB-257 255/0GA PC$3.50
Virginia Inst. of Marine Science, Gloucester Point.
Oxygen Consumption of the Blue Crab, 'Callinectes sapidus' Rathbun, from Proecdysis to Postecdysis,
Elizabeth G. Lewis, and Paul A. Haefner, Jr. 6 May 75, 7p VIMS-Contrib-690, NOAA-76060402
Grant NOAA-04-3-158-49
Pub. in Comparative Biochemistry and Physiology, v54A p55-60 1976.

Descriptors: *Crabs, *Oxygen consumption, Respiration, Crustacea, Animal physiology, Weight(Mass), Ocean environments.
Identifiers: Reprints, Sea Grant program, *Callinectes sapidus.

Closed system respirometry was used to measure total and weight-specific oxygen consumption of female blue crabs, Callinectes sapidus, in their final premolt (D sub 2 - D sub 4) molt (E) and postmolt (A sub 1 - B sub 1) stages. Total oxygen consumption increased with an increase in wet weight. Weight-specific oxygen consumption decreased as wet weight increased. Premolt crabs had a greater oxygen consumption than molting or postmolt crabs. Weight-specific oxygen consumption was depressed in exuviating and early postmolt crabs.

PB-257 260/0GA PC$3.50
Virginia Inst. of Marine Science, Gloucester Point.
Aspects of Molting, Growth and Survival of Male Rock Crabs, 'Cancer irroratus', in Chesapeake Bay,
Paul A. Haefner, Jr., and W. A. Van Engel. Dec 75, 14p VIMS-Contrib-669, NOAA-76060401
Grants NOAA-04-3-158-49, NOAA-1-36032
Pub. in Chesapeake Science, v16 n4 p253-265 Dec 75.

Descriptors: *Crabs, *Chesapeake Bay, Growth, Survival, Reproduction(Biology), Temperature, Salinity, Animal behavior, Crustacea, Animal ecology, Life cycles, Seasonal variations, Life span.
Identifiers: Reprints, Sea Grant program, *Cancer irroratus.

Male rock crabs, Cancer irroratus, were collected from the lower Chesapeake Bay during the winter dredge seasons of 1970-1973. Most crabs held in the laboratory molted in January, only 18% in February, thus confirming the pattern observed in the field. The molting season of male rock crabs appears to be related to decreasing seawater temperature. Signs of an approaching molt were determined by examining the mouth parts microscopically, and by testing the resiliency of the shell in the vicinity of the ecdysial suture line. Crabs larger than 100 mm carapace width did not molt. Width-weigh relationships of premolt and postmolt crabs were significantly different. Temperature-salinity tolerance experiments revealed that more crabs survived in 7C than in 17.5C. Stage B sub 1-B sub 2 crabs exhibited the highest survival and C sub 1-C sub 3 crabs the least.

PB-257 265/9GA PC$3.50
Michigan Univ., Ann Arbor. School of Natural Resources.
Assessment of the United States Lake Whitefish ('Coregonus clupeaformis') Fisheries of Lake Superior, Lake Michigan, and Lake Huron,
A. L. Jensen. 30 Dec 75, 15p NOAA-76061502
Sponsored in part by National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant. Pub. in Jnl. of the Fisheries Research Board of Canada, v33 n4 pt1 p747-759 1976.

Descriptors: *Fresh water fishes, *Lake Superior, *Lake Michigan, *Lake Huron, Assessments, Yield, Abundance, Lampreys, Mathematical prediction, Fishing, Regression analysis, Biomass, Tables(Data), Graphs(Charts), Canada.
Identifiers: Reprints, Sea Grant program, *Coregonus clupeaformis, Petromyszon marinus.

The logistic surplus production model is applied to lake whitefish (Coregonus clupeaformis) yield and effort data from Lake Superior, Lake Michigan, and Lake Huron. The fitted models indicate that the whitefish populations in most areas of the lakes have been overexploited, and that in these areas yield was below the maximum sustainable yield before sea lamprey (Petromyszon marinus) predation took its toll. In some areas of Lake Superior the whitefish populations are not over-exploited. The sea lamprey is the apparent cause of the drastic decrease in the whitefish population that occurred in northern Lake Michigan during the 1950's.

PB-257 341/8GA PC$4.00/MF$3.00
Florida Dept. of Natural Resources, St. Petersburg. Marine Research Lab.
Development of Spawning and Mass Larval Rearing Techniques for Brackish-Freshwater Shrimps of the Genus 'Macrobrachium (Decapoda Palaemonidae)',
Charles C. Dugan, Randolph W. Hagood, and Thomas A. Frakes. Oct 75, 37p Florida Marine Research Pub-12, Contrib-256, NOAA-76060201
Also pub. as ISSN-0095-0157.

Descriptors: *Shrimps, *Larvae, *Aquaculture, Brackish water, Fresh water, Temperature, Reproduction(Biology), Diets, Weight(Mass), Animal behavior, Photoperiodism, Survival, Growth.
Identifiers: Macrobrachium olfersii, Macrobrachium rosenbergii, Macrobrachium carcinus, Macrobrachium acanthurus, Macrobrachium ohione.

Year-round spawning was achieved by maintaining a constant temperature of 27.5C and a photoperiod of 14 hours light; simultaneous spawning by most females was accomplished by lowering temperature to 24C holding it for two weeks and raising it again. Of numerous larval diets tried, the most successful results were obtained by using Artemia nauplii, later supplemented with ground fish and beef heart. Various techniques were tried in mass larval rearing, including unfiltered closed systems, unfiltered systems with periodic water exchange, and various filtered closed systems. In juvenile growth experiments, M. acanthurus were grown to 65.5 mm mean length and 6.4 g mean weight in 133 days at a density of 49.5 per square meter with 88% survival.

PB-257 343/4GA PC$4.00/MF$3.00
North Carolina State Univ., Raleigh.
Techniques for Hatching and Rearing Cobia, 'Rachycentron canadum', through Larval and Juvenile States.
Sea Grant pub.,
William W. Hassler, and Robert P. Rainville. Dec 75, 30p UNC-SG-75-30, NOAA-76060111
Grant NOAA-04-3-158-40

Descriptors: *Marine fishes, *Aquaculture, Reproduction(Biology), Eggs, Sampling, Identifying, Animal growth, Larvae, Survival, Fisheries, Estuaries, Ocean environments.
Identifiers: Sea Grant program, *Rachycentron canadum, Commercial fishing.

In the report the possibilities of hatching and rearing cobia fish are assessed. The report evaluates the cobia's potential as a cultured organism by developing techniques of collecting, identifying and maintaining cobia eggs, and it defines the environmental conditions required for the growth and survival of larval and juvenile cobia.

PB-257 352/5GA PC$4.50/MF$3.00
Puerto Rico Dept. of Agriculture, Cabo Rojo. Lab. of Commercial Fisheries.
Common Names of Fishes in Puerto Rico,
Donald S. Erdman. Oct 74, 54p NOAA-76060203
Pub. in Cont. Serv. Aux. Oper. Cent., v4 n2 1974.

Descriptors: *Fishes, *Puerto Rico, *Taxonomy, Marine fishes, Fresh water fishes, Classifications, Sharks, Coasts, Aquaculture, Tables(Data), English language, Spanish language.
Identifiers: Reprints.

The main body of this report is a list containing the scientific fish names with their corresponding names in Spanish and English. The fishes are listed in phylogenetic order, beginning with the more primitive sharks and ending with the more specialized puffers. This order follows Bailey et. al. (1970).

PB-257 376/7GA PC$3.50
New York Sea Grant Advisory Service, Albany.
Controlling Aquatic Weeds,
Michael Duttweiler. Dec 75, 3p NYSSGI-AS-75-002, NOAA-76061408
Pub. in Marine Trades Flyer, n7 Dec 75. Sponsored in part by Department of Agriculture, Washington, D.C.

Descriptors: *Aquatic weeds, *Coasts, *North Atlantic Ocean, New York, Sea grasses, Water supply, Weed control, Aquatic biology, Marine biology.
Identifiers: Reprints, Ecosystems, Sea Grant program.

The article discusses the increasing problem of aquatic weed growth along the New York coastal waters. At present some alternative solutions have been undertaken. Each control treatment method is discussed briefly but as of yet no definite course of action has received preference.

PB-257 508-T/GA PC$12.00/MF$3.00
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
Structure and Function of Flower Nectaries (Stroenie i Funktsiya Nektarnikov Tsvetka Dvidolnikh Rastenii),
N. N. Kartashova. 1976, 465p TT-75-53101
Trans. of unidentified mono. pub. by Tomsk Univ. Press. 1965.

Descriptors: *Plants(Botany), *Flowers, Secretion, Plant anatomy, Plant physiology, Classifications, Plant genetics, USSR, Translations.
Identifiers: *Nectaries.

Contents:
Nectaries as secretory organs;
Anatomy of nectaries;
Morphology of nectaries and their topography;
Regarding the nature of nectaries and their classifications;
Evolution of nectaries.

PB-257 519/9GA PC$4.00/MF$3.00
State Univ. System of Florida Sea Grant Program, Gainesville.
Sharks and Man: A Perspective. Proceedings of a Conference Held November 20-21, 1975 in Kissimmee, Florida,
William Seaman, Jr. Feb 76, 43p Florida Sea Grant-10, NOAA-76062306
Grant NOAA-04-5-158-44
Sponsored in part by Florida Dept. of Natural Resources, Tallahassee, National Marine Fisheries Service, Washington, D.C., Mote Marine Lab., Sarasota, Fla., Coastal Plains Center for Marine Development Services, Washington, D.C. and Office of Naval Research.

Descriptors: *Sharks, *Meetings, Hazards, Reviews, Fish repellents, Animal behavior, History, Fishing, Recreation, Marketing, Law(Jurisprudence), Animal migrations, Animal ecology, Underwater environments, Seafood, Industries, Surveys.
Identifiers: Sea Grant program.

The report is the result of a series of talks given at a conference in Kissimmee, Florida sponsored by the Shark Research Panel. The aims of the conference were to assess the shark hazard problem; review anti-shark measures; consider ways to increase commercial utilization, evaluate legal liabilities, and identify needs for followup actions, whether research, industry, or public information-oriented.

6E. Clinical Medicine

AD-A029 188/0GA PC$5.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Role of the United States Army Surgeon: Past, Present, and Future.
Final rept.,
Thomas F. Grimes, Jr. 11 Jun 76, 95p
Master's thesis.

Descriptors: *Military medicine, *Medical personnel, Physicians, Roles(Behavior), Literature surveys, Military commanders, Surveys, Theses, History, Field conditions, Attitudes(Psychology), Surgery.

The role of the military surgeon has markedly changed in recent years, including frequent replacement of physicians by Medical Service Corps officers. Definitions of the surgeon's role are examined and definitions of military medicine are analyzed. The history of the development of the American Military Surgeon is outlined, with emphasis on the acquisition and training of the surgeon and the strong traditions of the American military physician are portrayed. The perceptions of 1976 Command and General Staff College students toward the evolving role of the surgeon were determined by a survey which indicated recognition of the existence of Army Medicine. The students favored retaining the physicians role in field units and maintaining a distinct Army military medical department, but they did not recognize requirement for extensive military training of the physician.

AD-A029 218/5GA PC$8.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Danger of Premature Burial Following Erroneous Pronouncement of Death on the Battlefield.
Final rept.,
William A. Carleton, Jr. Jun 76, 231p
Master's thesis.

Descriptors: *Death, Attitudes(Psychology), Military personnel, Humans, Life(Biology), Casualties, Combat areas, Theses.
Identifiers: *Burial, Mortuary, Body bags.

This study examines the potential for error during early separation of the wounded from the dead combat operations. Attention is focused primarily upon public attitudes and military policies which allow a significant number of apparently dead casualties to bypass medical screening entirely. This thesis concludes that a possibility exists for wounded, but live, soliders to be misdirected into graves registration channels without medical examination.

AD-A029 228/4GA PC$3.50/MF$3.00
Gorgas Memorial Lab Balboa Heights Canal Zone
Immunity in Chagas' Disease.
Final rept. Sep 73-May 76,
Duell E. Wood. 25 Aug 76, 16p
Contract N00014-73-C-0108

Descriptors: *Trypanosoma cruzi, *Immunity, Antigens and antibodies, Immunization, Diagnosis(General), Test methods, Cultures(Biology).
Identifiers: Trypomastigotes, *Chagas disease.

This is the final report on the immunity in Chagas' disease contract and it summarizes the results of a diversity of studies directed toward understanding the immunology of this dreaded affliction. Among the achievements mentioned are the development of a culture system which provides infective form Trypanosoma cruzi for immunology studies and the use of these infective forms in the development of a sensitive specific, indirect immunofluorescent antibody test for Chagas' disease. Also mentioned are the facts that the cell membranes of live trypomastigotes are not immunoreactive with the humoral immune response of an infected host and that suppression of parasitemias in chronic Chagas' disease is probably a function of the cell immune system of the host. (Author)

AD-A029 289/6GA PC$3.50/MF$3.00
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
Use of Xenon(133) in Early Diagnosis of Inhalation Injury.
Robert N. Agee, James M. Long, III, John L. Hunt, Peter A. Petroff, and Robert J. Lull. 1976, 7p
Availability: Pub. in Jnl. of Trauma v16 n3 p218-224 Mar 76.

Descriptors: *Diagnosis(Medicine), *Radioactive isotopes, *Lung, *Burns(Injuries), Xenon, Mortality rates, Inhalation, Trauma, Respiratory system, Reprints.

Xenon(133) lung scanning post-thermal injury was used to detect inhalation injury in 86 patients admitted to the United States Army Institute of Surgical Research during 1974. Inhalation injury was indicated by the 37(43%) positive scans. Based on all available clinicopathologic evidence, 11 (13%) of the scans were erroneous with seven (8%) falsely positive and four (5%) falsely negative. Eighty-six per cent of the scans were appropriate. Addition of bronchoscopy and/or pulmonary function testing appeared to improve diagnostic accuracy. By using any pair of tests, falsely negative diagnosis were virtually eliminated. Inhalation injury, as expected, had an adverse effect on survival rates. The group of patients whose expected mortality lay between 40 and 59% were most notably affected. One hundred per cent (five of five) of those with inhalation injury died; only one of eight without inhalation injury died. (Author)

AD-A029 305/0GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Changes in Plasma Cold-Insoluble Globulin Concentration During Experimental Rocky Mountain Spotted Fever Infection in Rhesus Monkeys,
Deane F. Mosher. 26 Feb 76, 9p
Availability: Pub. in Thrombosis Research, v9 n1 p37-45 1976.

Descriptors: *Rickettsia rickettsii, Globulins, Rhesus monkeys, Concentration(Chemistry), Blood coagulation, Fibrin, Fibrinogen, Reprints.
Identifiers: *Rocky mountain spotted fever, *Cold insoluble globulins, Experimental data.

Cold-insoluble globulin (CIG) concentration was measured in plasma obtained serially from Macaca mulatta experimentally infected with Rickettsia rickettsii. CIG concentration was decreased in all severely infected monkeys, in some to values only 15-25% of the concentration measured prior to infection. Decreased CIG concentration correlated with increased fibrin/fibrinogen degradation products in serum and number of rickettsiae in whole blood.

AD-A029 307/6GA PC$3.50/MF$3.00
School of Aerospace Medicine Brooks AFB Tex
Application of Hyperbaric Oxygen Therapy in a Case of Prolonged Cerebral Hypoxia Following Rapid Decompression,
Paul J. Sheffield, and Jefferson C. Davis. 1976, 6p Rept no. SAM-TR-76-249
Availability: Pub. in Aviation, Space and Environmental Medicine, v47 n7 p759-762 1976.

Descriptors: *Hyperbaric conditions, *Explosive decompression, Aviation accidents, Hypoxia, Edema, Brain, Case studies, Training planes, Signs and Symptoms, Reprints.
Identifiers: Oxygen Therapy, Hyperbaric medicine.

The first known and previously unpublished report of the use of hyperbaric oxygen (HBO) in the treatment of prolonged cerebral hypoxia is reported in an incident involving a USAF T-39 aircraft that underwent rapid decompression from 753 mb (2,438 m or 8,000 ft) to 148 mb (13,716 m or 45,000 ft). Within five to eight seconds, the pilot lost consciousness because he did not don his oxygen mask and therefore was unable to obtain supplemental oxygen immediately. After a delay of six to eight minutes, he was given supplemental oxygen at and below 697 mb (3,048 m or 10,000 ft). On the ground, the pilot was blind and disoriented. This condition persisted for 6.5 hours, at which time HBO was administered. Orientation and vision were regained; neurologic findings were negative. It is concluded that HBO therapy was effective in treating this case of prolonged cerebral hypoxia.

AD-A029 347/2GA PC$3.50/MF$3.00
Qei Inc Bedford Mass
Joint Army-Navy Air Crew Impact Injury Prevention Program.
Annual rept. 1 Nov 73-31 Oct 74,
Harvey E. Sbisa, and Rodney W. Thorpe. 1 Nov 74, 12p Rept no. IM-1-Nov-74-1
Contract N00014-70-C-0082

Descriptors: *Computer applications, *Wounds and injuries, Data processing, Mathematical models, Electrocardiography, Flight crews, Computerized simulation, Impact, Acceleration, Regression analysis, Tracking, Three dimensional, Angular motion, Computer programs, Sleds.

This annual report covers the mathematical analysis and computer-related effort supplied by the originator in support of the Joint Army/Navy Air Crew Impact Injury Prevention Program. An important part of this effort was the analysis, coding and debugging of an EKG Wave Form Recognition and Analysis Program. The mathematical analysis, coding and debugging of three other computer programs connected with the Horizontal Accelerator data processing effort were also completed during this period. These three programs are: the 3-D Transformation Program, the Angular Velocity Peak Detection and Regression Analysis Program and the Runge-Kutta 3-D Tracking Program.

AD-A029 393/6GA PC$4.00/MF$3.00
Qei Inc Bedford Mass
Joint Army-Navy Air Crew Impact Injury Prevention Program.
Annual rept. 1 Nov 74-31 Oct 75,
Harvey E. Sbisa, John W. Kuipers, Rodney W. Thorpe, and William F. Burnham. 1 Nov 75, 29p Rept no. IM-1-Nov-75-1
Contract N00014-70-C-0082

Descriptors: *Computer applications, *Wounds and injuries, Flight crews, Photographic processing, Computerized simulation, Manpower utilization, Sleds, Impact, Computer programs, Electrocardiography, Data processing, Information systems, Blood chemistry, Management information systems, Remote terminals, Acceleration, Mathematical models.
Identifiers: Medical histories, Medcon requirements program, *Contingency planning.

This annual report covers the mathematical analysis and computer-related effort supplied by the originator in support of the Joint Army/Navy Air Crew Impact Injury Prevention Program and the Navy Bureau of Medicine Medical Contingency Requirements Program. The mathematical analysis, coding and debugging were performed for the following programs connected with the Horizontal Accelerator data processing effort: the X-Ray Anthropometry Program, Conversion/Scaling Program, the Random Access Program, the Horizontal Sled Test Report Program, the Regression Analysis of Peak Rotational Acceleration and Velocity program, the Principal Component Analysis Program, the Spectral Analysis Program, the Filter Program for Horizontal Sled Accelerometer Data, and other programming tasks. A system was devised to perform Blood Chemistry Data Processing. A number of tasks in the Management Information area were also performed. For the Navy Bureau of Medicine a mathematical method was devised to calculate the Navy Medical Contingency Requirements in beds and medical personnel for any desired time periods and areas.

AD-A029 428/0GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Hyperosmolar Hyperglycemic Non-Ketotic Dehydration. Etiology, Pathophysiology and Prevention during Total Parenteral Alimentation,
M. V. Kaminski, Jr. 1975, 17p
Presented at Proceedings of the International Symposium on Intensive Therapy, 30 May-2 Jun 75, Rome (Italy).

Descriptors: *Dehydration, Hypothalamus, Hyperglycemia, Catecholamines, Hormones, Stress(Physiology), Urine, Insulin, Diuresis.
Identifiers: Parenteral hyperalimentation.

Records of 200 patients, nutritionally supported by synthetic means, were reviewed for evidence of clinical HHND. A 3% incidence of morbidity with a single mortality was discovered. Examination of the laboratory values of these patients demonstrated a 100% positive correlation between persistent glucosuria and HHND. The pathophysiology of HHND is discussed, demonstrating a relative hypoinsulinism, with insulin sufficient to prevent lypolysis but insufficient to prevent hyperglycemia, glucosuria, and osmotic diuresis. Special reference is made to the mechanisms and management of the pseudodiabetes of stress. It is concluded that HHND is an entirely avoidable iatrogenic morbidity. Prevention of osmotic diuresis, secondary to glucosuria, and therefore prevention of HHND, is achieved by providing exogenous insulin sufficient to prevent glucosuria.

AD-A029 444/7GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Resume of the Discussion Concerning the Nutritional Consequences of Infection.
Interim rept.,
William R. Beisel. 20 Aug 76, 21p

Descriptors: *Nutrition, *Infections, Immunity, Body temperature, Anorexia, Diet, Diarrhea, Gastroenteritis, Enzymes, Endotoxins, Amino acids, Metabolism, Proteins, Physiology, Biochemistry.
Identifiers: Leukocytic endogenous mediator.

The discussion of papers presented during the session on Nutritional Consequences of Infection covered topics which included the changing concepts of 'body wasting' during acute and chronic infections, the effects of fever, reduced dietary intake, gastrointestinal disturbances, and the role of various acute-phase reactant proteins and endogenous mediator substances produced by host cells. Comments were made concerning the response of various enzymes and amino acids during an infectious process. The effect of malnutrition on host immune mechanisms was also addressed.

AD-A029 448/8GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Lesions in Guinea Pigs Infected with 'Coxiella burnetii', Strain M-44.
Interim rept.,
James W. Johnson, Charles G. McLeod, James L. Stookey, Glen A. Higbee, and Carl E. Pedersen, Jr. 18 Aug 76, 14p

Descriptors: *Coxiella burnetii, *Vaccines, *Q fever, Rickettsiaceae, Live vaccines, Attenuation, Bioassay, Laboratory animals, Guinea pigs, Lesions, Pathology, Heart, Liver, Spleen, Histology.

Guinea pigs inoculated with the live, M-44 vaccine strain of Coxiella burnetii were examined grossly and microscopically for the presence of Q fever-related lesions. Mild myocarditis was observed in 38% of infected, but in none of the control animals. Livers showed significant incidence of hepatitis, necrosis and granuloma formation, especially during the first eight days of the infection. A much lower incidence of splenitis was also found but was considered to be of borderline significance. Generally, lesions were mild in nature and none seemed to endanger the life of the animal or cause observable distress.

AD-A029 473/6GA PC$3.50/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Pathology of Chronic Bolivian Hemorrhagic Fever in the Rhesus Monkey,
Charles G. McLeod, Jr., James L. Stookey, Gerald A. Eddy, and Stephen K. Scott. 25 Mar 76, 14p
Availability: Pub. in American Jnl. of Pathology, v84 n2 p211-224 Aug 76.

Descriptors: *Bolivian hemorrhagic fevers, Lesions, Pathology, Rhesus monkeys, Signs and symptoms, Central nervous system, Cardiovascular system, Reprints.

Gross and microscopic lesions of Bolivian hemorrhagic fever (BHF) are described in 10 rhesus monkeys that survived from 30 to 78 days after subcutaneous inoculation with a dose of 1000 plaque-forming units (PFU) of Machupo virus, a dose which produces a severe and generally fatal disease. Six of the monkeys had been given low doses of homologous immune globulin when initial signs of infection appeared. Monkeys exhibited clinical signs in two phases. Microscopic lesions were similar in

both immune globulin-treated and untreated animals. These included widespread lymphoreticular infiltrates in the walls and adventitia of blood vessels of the brain, spinal cord, pancreas, intestine, liver, kidney, adrenal, parathyroid, heart, and skeletal muscle. Diffuse lymphocytic infiltrates not confined to the vascular or perivascular tissues were present to a variable degree in many of these and other organs. Several monkeys exhibited lymphocytic inflammation of the choroid, meninges, peripheral nerves, and ganglia.

AD-A029 479/3GA PC$3.50/MF$3.00
Louisiana State Univ Medical Center New Orleans Dept of Physiology
Ineffectiveness of Heparin Treatment in Burn Shock in the Guinea Pig,
Robert R. Wolfe, and Harvey I. Miller. 1976, 6p
Contract N00014-74-A-0054-0003
Availability: Pub. in Aviation, Space and Environmental Medicine, v47 n6 p652-656 Jun 76.

Descriptors: *Traumatic shock, *Burns(Injuries), *Heparin, Shock(Pathology), Guinea pigs, Cardiovascular system, Blood coagulation, Treatment, Survival(General), Mortality rates, Metabolism, Reprints.

The cardiovascular and metabolic responses during burn shock were characterized in 10 guinea pigs burned to the xyphoid process for 3 s in boiling water. This produced a burn of approximately 70% of the body surface. Their responses were compared to the values obtained at corresponding times in a group of unburned controls (n = 10). The effect of Heparin treatment on burn shock was evaluated in another group (n = 8) of guinea pigs burned to the xyphoid process and injected subcutaneously with 50,000 U Heparin/kg immediately after being burned. Hemoconcentration was evident in the BUT animals, and there was an elevation in the post-burn glucose and lactate levels, a decrease in pH, and no change in free fatty acids. Heparin treatment did not significantly modify 24-h survival, and the post-burn cardiovascular responses of the Heparin-treated animals were similar to those of the BUT animals. Metabolically, the Heparin-treated animals had a significant elevation in free fatty acids post-burn, but otherwise closely resembled the BUT animals.

AD-A029 481/9GA PC$3.50/MF$3.00
Naval Medical Research Unit No 5 Apo New York 09319
Common Bacterial Pathogens in Addis Ababa, 1969-1974. I. Frequency of Isolation.
Technical scientific rept.,
Peter L. Perine, Petros Wolde-Gabriel, Alebachew Tassew, and James C. Welch. 1975, 12p Rept no. NAMRU-5-TR-10
Availability: Pub. in Ethiopian Medical Jnl., 13 p61-70 1975.

Descriptors: *Bacterial diseases, Pathogenic microorganisms, Epidemiology, Geographical distribution, Isolation, Antibiotics, Sensitivity, Cultures(Biology), Reprints.
Identifiers: Addis ababa.

Although the contribution of the non-tuberculosis bacterial diseases to morbidity and mortality in Ethiopia is not known, analysis of the causes of hospital admissions in four cities suggests that certain bacterial infections are common in both Ethiopian adults and children. This is the first of a series of companion articles reporting the frequency of isolation of common bacterial pathogen in Ethiopia and their sensitivity to a spectrum of antibiotics. (Author)

AD-A029 515/4GA PC$3.50/MF$3.00
Naval Medical Research Unit No 5 Apo New York 09319
Oral Therapy for Acute Dehydrating Diarrhoeas.
Technical scientific rept.,
Craig K. Wallace. 1975, 6p Rept no. NAMRU-5-TR-13
Availability: Pub. in Ethiopian Medical Jnl., v13 p181-184 1975.

Descriptors: *Diarrhea, *Electrolytes, *Cholera, Therapy, Dehydration, Absorption, Glucose, Ingestion(Physiology), Formulations, Sodium, Potassium, Reprints.

A treatment regimen using glucose-electrolyte solutions by mouth has evolved during the past quarter century. Such a solution, initially, was used in cholera, however, during the past 10 years, much clinical experience has been gained in the use of such solutiions for all types of diarrhea. Application has been accepted as an easy and practical approach for dehydrating diarrheas of both adults and children. A solution containing sodium chloride 4 g/liter, sodium bicarbonate 4 g/liter, potassium chloride 1.5 g/liter and glucose 20 g/liter is recommended. (Author)

AD-A029 574/1GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Reprint Accession List 1975. Number 6. January 1976.
Jan 76, 22p
See also report dated January 1975, AD-A014 206.

Descriptors: *Medical research, *Bibliographies, Chemistry, Biochemistry, Nutrition, Chemotherapy, Hematology, Immunology, Ophthalmology, Parasitology, Pathology, Veterinary medicine, Virology, Medicine, Zoology, Epidemiology, Helminthic diseases.

The volume contains citations of 54 technical/scientific articles published by scientist associated with the U.S. Naval Medical Research Unit No.3, Cairo, Egypt. These citations are listed by reprint number and cross-linked by subject and author.

AD-A029 668/1GA PC$6.00/MF$3.00
Madigan Army Medical Center Tacoma Wash
Clinical Investigation Service Annual Research Progress Report, Fiscal Year 1976,
Bruce L. Fariss. 1 Jul 76, 146p

Descriptors: *Medical research, *Veterinary medicine, Abstracts, Carbohydrates, Glucose, Hormones, Neoplasms, Radioactive isotopes, Blood analysis, Surgery, Pediatrics, Genetics, Dentistry, Pathology.
Identifiers: Parenteral hyperalimentation.

This report identifies those individuals who are conducting investigative protocols at Madigan Army Medical Center. An abstract of each protocol giving abbreviated technical objectives, methods, and progress is presented.

HRP-0000017/4GA PC$5.00/MF$3.00
Virginia State Council of Higher Education, Richmond.
Report of the First Phase of a Study of Health Manpower Requirements.
Nov 72, 91p
Prepared in cooperation with Bureau of Health Planning and Resources Development, Rockville, Md.

Descriptors: *Virginia, *Health manpower, *Health care requirements, Health resources, Health care delivery, Health manpower education, Medical education, Physicians, Nurses, Distribution, Allocations, State government, Assessments, Recommendations.

A study of manpower needs in Virginia describes the State's health delivery system, examines existing manpower, and determines manpower allocation gaps and problems in health services. The overall purpose of the study is assessing health manpower needs to determine what educational programs should be offered. Findings revealed that a concern for the shortage of physicians has resulted in increased enrollments, admission of more Virginia residents, and establishment of residency programs for preparation of family physicians. Since there have been large increases in educational programs for nurses, a statewide plan is required before new nursing programs are initiated. Recommendations include establishment and operation of a health manpower and resource data bank for Virginia, collection of information about post-secondary education in this field, provision of future funding for continuing study of health manpower requirements, and study of area health education centers. Portions of this document are not fully legible.

HRP-0000019/0GA PC$4.50/MF$3.00
Metropolitan Washington Council of Governments, D.C.
Health Information System.
Quarterly progress rept.
1973, 52p
Prepared in cooperation with Group Hospitalization, Inc., Washington, D.C.

Descriptors: *Information systems, *Health resources, Surveys, Objectives, Health manpower, Metropolitan areas, Health care services, Health care facilities, Virginia, Maryland, District of Columbia.

The report, covering a three-month period in 1973, deals with work being performed on a contract between Group Hospitalization, Inc. and the Metropolitan Washington Council of Governments to gather data for the Health Information System. The major objective of this system is to gather data that can be used in the planning, allocation, and evaluation of health resources. The system deals primarily with acute care hospitals, mental health, ambulatory care, long-term care, physical medicine and rehabilitation, special services, and approximately seventeen categories of health manpower, with emphasis on physicians and dentists. Portions of this document are not fully legible.

HRP-0000092/7GA PC$3.50/MF$3.00
Office of Emergency Preparedness, Washington, D.C.
A Model for Multi-Hospital Preparedness.
1971, 16p
Prepared in cooperation with Health Services and Mental Health Administration, Rockville, Md. Div. of Emergency Health Services, Office of Civil Defense, Washington, D.C., and Hospital Council of Southern California, Los Angeles.

Descriptors: *Health planning, *Disasters, *Emergency medical services, Accidents, Communities, Preparation, Models, Hospitals, Health care delivery, Radio communication, Tests, California.

The study documents a multi-hospital disaster preparedness program as it was developed by a group of four prominent Los Angeles hospitals: Cedars of Lebanon Hospital, Childrens Hospital of Los Angeles, Hollywood Presbyterian Hospital, and Kaiser Foundation Hospital. It has been determined that the individualistic approach to disaster planning is obsolete, but that medical and hospital groups working together can respond effectively. In the Southern California model, the initiative for implementing the disaster plan was provided by the director of Outpatient Services for Childrens Hospital of

Los Angeles. The original group of hospital representatives meets monthly.

HRP-0000544/7GA PC$3.50/MF$3.00
Oregon Nurses Association, Portland.
A Guide for Assigning Responsibilities to Nursing Service Personnel.
1976, 16p

Descriptors: *Nursing, *Oregon, *Health manpower, Regulations, Allocations, Guidelines, Licensed practical nurses, Registered nurses, Patients, Law(Jurisprudence), Legislation, Allied health personnel.

The purpose of the guide was to help differentiate between the functions of the several categories of nursing services personnel, based on provisions in the Oregon Law Regulating the Practice of Professional Nursing, the Code for Nurses, the Oregon Licensed Practical Nurse Law, and the Oregon Nurses Association Position Statement on the Registered Nurse. The R.N.'s responsibilities include assessing patient needs; planning and giving individualized nursing care; implementing nursing care plans and evaluating them; coordinating all activities of patient care; supervising nursing care. The L.P.N.'s responsibilities include providing for emotional and physical comfort and safety of patients; observing, recording and reporting the physical and mental signs of patients; assisting with patient rehabilitation. Responsibilities of auxiliary workers (orderlies, attendants) include assistance with admission, discharge and transfer of patients, performance of personal care services, and response to emergency situations.

HRP-0000649/4GA PC$6.75/MF$3.00
West Virginia Regional Medical Program, Morgantown.
Health Care and the Law,
Franklin D. Cleckley, and William M. Aston.
1971, 160p

Descriptors: *Health care, *West Virginia, Tables(Data), Legislation, Law(Jurisprudence), Regulations, Guidelines, Hospitals, Medical personnel, Professional personnel, Emergency medical services, Abortion, Medical malpractice, Venereal diseases, Sterilization.

The study is designed to present members of the health professions in West Virginia with a general introduction to the numerous legal - medical problems in the state, and to serve as a guideline to the rules and regulations that govern the health professions. Individual sections are devoted to each of the areas of hospital law, medical professionals, state and local health agencies, abortions, ambulances and emergency service vehicles, cadavers, reports of venereal disease, malpractice, the physician - patient privilege, the Good Smaritan Law, and sterilization. The section on hospital law consists of an inclusive discussion of admitting and discharging patients, treatment without consent, records, hospital immunity and sovereign immunity, in relation to the laws in West Virginia.

HRP-0000669/2GA PC$4.00/MF$3.00
Illinois Regional Medical Program, Chicago.
Survey of Inactive Nurses: Why Illinois Nurses Leave Their Jobs and What Prompts Them to Return.
1971, 42p

Descriptors: *Nurses, *Illinois, *Health resources, Allied health personnel, Health manpower, Surveys, Incentives, Questionnaires, Employment, Tables(Data).

A survey of inactive registered nurses (RNs) in Illinois concentrates upon situations responsible for their inactivity and incentives for return to active duty. The survey was conducted by the Illinois Regional Medical Program with the cooperation of the Illinois Nurses Association. A copy of the questionnaire submitted to the 13,012 RNs who reported themselves as inactive in 1968 and 3908 RNs who did not indicate their employment status in 1968 is given. Approximately 57% of the questionnaires were returned.

HRP-0000687/4GA PC$5.50/MF$3.00
California Univ., Berkeley. Office of the President.
Planning for the Health Sciences, 1970-1980; A Ten-Year Plan.
Nov 70, 118p

Descriptors: *Health manpower education, *California, *Health planning, Forecasting, Health care requirements, Expenses, Costs, Universities, Tables(Data), Guidelines, Medical personnel.

In a 10 year academic, physical, and fiscal plan for the health services prepared for the California state legislature, the office of the president of the University of California proposes to double the enrollment and the state funded operating budget for education in health sciences by 1980. Data on California's present and projected needs in health services are discussed, and the university's role in meeting these needs is outlined. The capital outlay for the projected expansion, based on current construction costs, is expected to reach $48-,600,000, operating expenditures for 1979/80 are expected to increase 97.3% over the 1970/71 figure to a total of $272,847,000. The total enrollment in health science programs is expected to increase 110% over the 10 year period, reaching an estimated 14,728 in 1979/80.

HRP-0001000/9GA PC$5.00/MF$3.00
Minnesota State Planning Agency, St. Paul, Comprehensive Health Planning Program.
Credentialing Health Personnel in Minnesota. A Report to the Legislature.
1972, 100p

Descriptors: *Licenses, *Health personnel, *Minnesota, Health occupations, Legislation, Medical personnel, State government, Policies, Recommendations, Physicians, Physician assistants, Law(Jurisprudence).

The Advisory Council endorses the position that a moratorium be placed on further licensing of health occupations not currently licensed. The creation of a focal point within state government for continuous development of credentialing policy is also recommended. Physicians should be authorized in statute the right to delegate medical acts, tasks and functions to trained physicians assistants who are regulated by the Board of Medical Examiners. Present statutory definition of nursing practice is held to be broad and encompassing, and further definition of professional functions may restrict rather than facilitate expanding the scope of nurse practice. A bill for an act to implement the credentialing plan is presented in draft to the legislature.

HRP-0001025/6GA PC$4.50/MF$3.00
Oklahoma Health Sciences Foundation, Inc., Oklahoma City.
Toward a State Plan for Health Manpower in Oklahoma.
1970, 70p

Descriptors: *Health planning, *Health manpower, *Oklahoma, Health care facilities, Health manpower education, Design, Tables(Data), Interviews, Surveys, Objectives, Projects.

Under contract to the Oklahoma State Health Planning Agency (OSHP), the Oklahoma Health Sciences Foundation (OHSF) has prepared a design and implementation outline for statewide planning of health care facilities and health occupation training. This report, issued in December 1970, contains a design for health manpower planning formulated by OHSF which includes a discussion of the information needed for such a planning process, the means for obtaining that information, and how the information obtained is to be used. State Health Planning Agency for which this study was prepared was created in 1967 to organize and administer statewide comprehensive health planning activities, and this report also contains a summary of the work program of the agency for the period from July 1, 1970 to June 30, 1971.

HRP-0001037/1GA PC$6.00/MF$3.00
Nortex Regional Planning Commission, Wichita Falls, Tex.
Perinatal Mortality in the North Texas Planning Region. A Comparative Study,
John L. Enrigh. 1972, 131p

Descriptors: *Infants, *Infant health care, Obstetrics, Questionnaires, Surveys, Morbidity, Texas, Mortality, Age, Pregnancy, Humans, Reviews, Embryos, Health care services, Sex, Weight, Ethnic groups, Methodology, Recommendations, Tables(Data), Socioeconomic factors.

The paper presents a study of perinatal mortality rates and their contributing factors in the North Texas Planning Region in an effort to determine the reasons for high infant and fetal mortality in the region and to propose measures which would improve the situation. The obstetrical services of 12 hospitals, having 22 to 100 beds and serving small communities in the region, were studied in relation to various aspects of perinatal mortality. During the study period from January 1969 through December 1971, 2539 births, 87 perinatal deaths, 51 neonatal deaths, and 31 fetal deaths were recorded. Variables used in the study were: age of mother, gestation of pregnancy, infant birth weight, prenatal care, parity, sex of infant, prematurity, ethnic group, and illegitimacy in relation to age of mother and ethnic group.

HRP-0001559/4GA PC$4.50/MF$3.00
Torrence Park Citizens Committee, Decatur, Ill.
Torrence Park Neighborhood Health Survey. February - March 1971.
Jun 71, 54p

Descriptors: Urban health services, Urban areas, State regions, Public health, Methodology, Measurement, Indexes(Ratios), Illinois, Health statistics, Health care, Health care services, Health care requirements, Health care indexes, Demography, Data, Communities.

Critical deficiencies in the delivery of individual health care services in Decatur, Illinois are identified for the purpose of assisting in local planning and obtaining appropriate Federal support for development of health care services. A random sample of 148 families (671 persons) was interviewed. The survey instrument contained questions about number of family members, income, housing, and medical problems such as size of annual medical bills and the number of family members in the hospital during the year. Comparative sampling data from the Small Cities Survey Center Study were included. The results show that dental problems are evident in over half of all families; 60 to 70 percent appear to obtain no preventive dentistry. One-third of those questioned have no family doctor. Many low income and elderly people needs range from transportation to medical facilities. Mental health services are lacking, and nutritional advice is needed. Care

of vision also appears to be deficient. Only half of the families indicate an interest in birth control. A rodent problem indicates a need for improved garbage pickup. Portions of this document are not fully legible.

HRP-0001636/3GA Not available NTIS
Columbia Univ., New York.
Young Physician - Living with Uncertainty.
Eli Ginzberg. 1973, 6p
Pub. in Pharos of Alpha Omega Alpha Honor Medical Society v36 n1 p12-17 1973.

Descriptors: United States, *Physicians, Health resources, Health occupations, Health manpower.

Ten major trends affecting the scope and functioning of American medicine are described, and their implications for physicians, especially young physicians are identified. Among the subjects discussed are: the use of Federal funds for medical schools; increases in medical school funding; third party involvement; increasing medical costs and more critical approaches toward spending health care dollars; regional planning relative to the specialty situation; the uneven distribution of medical professionals; the use of health maintenance organizations; the hospital as the prevailing center of medical care; and the dissatisfaction of the public with the medical care it is receiving. The implications of these trends for physicians include a potential oversupply of physicians; a shift from private to salaried work; oversupplies in neurosurgery, gynecology and obstetrics, and pediatrics resulting from the decreasing birthrate; the increasing overhead costs of entering private practice; the fee control exercised by third parties, insurance companies, and government; new corporate arrangements in the practice of medicine; and the increasing tension between university-based or large teaching hospitals and community practitioners. Additional factors include a more sophisticated public, the increasing involvement of medical planners with social planning, and the possibility of many struggles within the health fraternity.

HRP-0001655/6GA PC$4.00/MF$3.00
Rochester Regional Medical Program, N.Y.
Study of Three Small Upstate Emergency Departments.
J. William Gavette, and Christine Thurber. Apr 72, 47p
This document is number one in the Rochester Regional Medical Program Health Information Series.

Descriptors: State regions, New York, *Health resources, Health care utilization, Health care facilities, *Emergency medical services.

This report presents statistics relating to the utilization of three rural community hospital emergency departments in New York. Results indicate using the services of a physician extender in the emergency room. The data show that the emergency department services a significant number of minor visits that might be effectively managed by a nurse practitioner. Full-time support of such a person on a three-shift basis could not be economically justified because of the low rate of visits to the department. It is suggested that the solution to the emergency department problem includes minimizing the demand for physician services, possibly by expanding service through a convenience clinic. This clinic would operate with the intent of providing the community with a readily accessible, 24-hour, primary care service. Sponsored by either the hospital, local medical society, local government or a combination of these, the convenience clinic would provide service to walk-in patients or refer them to a more appropriate organization if necessary. Footnotes and appendices are included.

HRP-0001714/5GA Not available NTIS
Mount Sinai School of Medicine, New York.
Surgical Workloads in a Community Practice.
Edward F. Hughes, Victor R. Fuchs, John E. Jacoby, and Eugene M. Lewit. 1971, 14p
Pub. in Surgery v71 n3 p315-327 1972.

Descriptors: State regions, *Physicians, New York, Health resources, Health occupations, Health manpower, Health care utilization.

This report of the utilization of surgeons presents the results of a study quantifying in-hospital surgical workloads. No attempt is made to measure the nonoperative workloads of surgeons. The study correlates fees to time spent in operating. To obtain a standard value, the fee for each category is divided by the fee value for an adult herniorrahaphy, which is a fairly standard procedure. The resulting quotient expresses the value of each category as hernia equivalents. This weighing system is applied to general surgeons to measure their workloads. The study population consists of the 19 general surgeons of a medium-sized hospital in New York. All operating room surgical procedures for one year are expressed in hernia equivalents. An additional 20 percent is added to cover secondary procedures. The results show an average of 3.1 hernia equivalents per week. The report concludes that this represents an underutilization of specialized medical skills. A survey of surgeons yields ten hernia equivalents as the optimum workload, leaving sufficient time for leisure and continuing education. Results are also broken down by age and certification of surgeons and complexity of operations included.

HRP-0001748/3GA Not available NTIS
American Medical Association, Chicago, Ill. Council on Health Manpower.
Continuing Competence of Physicians.
1971, 6p
Reprinted from the Jnl. of the American Medical Association v217 n11 p1537-1541 13 Sep 71.

Descriptors: United States, Quality assurance, *Physicians, Performance tests, Methodology, *Medical personnel, Measurement, Health occupations, Health manpower, *Health manpower education, Health education, Health care, Continuing education.

This report discusses the efforts being made to insure continuing physician competence. Two approaches to maintaining competence are continuing education programs and medical care evaluation through practice observation. Continuing education courses increased by ten percent per year from 1961 to 1971. Of these courses, one-fourth were open only to a given specialty. The professional journal is another channel of continuing education. The second approach to maintaining competence is through medical care evaluation and peer review of performance. While this is possibly the best method, many physicians do not have any hospital affiliation, and thus, no peer review is available. Another problem is that some physicians serving on peer review committees fear that the required activities will expose them to legal liabilities. Several States have enacted legal immunity statutes to remove this fear. The report proposes three alternative incentives for maintaining competence: grant awards or recognition; discontinue professional privileges or certification; and discontinue licensure or impose other legal sanctions. It further recommends that constituent medical associations be encouraged to require periodic documentation of members' participation in continuing education, and to establish periodic recertification programs.

HRP-0001762/4GA Not available NTIS
National Board of Medical Examiners, Philadelphia, Pa.
Evaluation, Certification, and Licensure in Medicine. New Directions.
John P. Hubbard. 1973, 6p
Pub. in Jnl. of the American Medical Association v225 n4 p401-406 1973.

Descriptors: Regulations, Quality assurance, Physicians, Methodology, *Medical personnel, Licenses, Health occupations, *Health manpower, Health care, Credentials, Certification.

This report, prepared by the National Board of Medical Examiners (NBME), presents guidelines for the gradual development of an orderly system for the evaluation of professional competence. In the past, the NBME administered tests after two years of basic science, after two more years with the clinical department, and again after internship. Changes in degree and training needs, and a shift from 4-year to 3-year curriculums have left the NBME tests unsuitable as evaluation criteria. There is also a great deal of overlapping between the National Board, special competence boards, and internal medicine test boards. The NBME therefore recommends the following system: (1) an examination at the end of undergraduate studies, which would only be accepted as the basis for legal recognition that the individual is qualified to care for patients under supervision, as in hospital residency programs; and (2) an evaluation of specialty qualifications at the end of graduate education, which would allow certification for full independent medical practice. Those physicians who choose not to obtain specialty certification would fall under the determination of State Boards of Medical Examiners. The final stage would be periodic evaluation of professional competence required for recertification or relicensing.

HRP-0001936/4GA PC$5.50/MF$3.00
Bureau of Health Resources Development, Rockville, Md.
Migration of Foreign Physicians to the United States: The Perspective of the Health Manpower Planner.
Kathleen N. Williams, and Betty A. Lockett. Sep 73, 124p

Descriptors: United States, Policies, *Physicians, Objectives, Methodology, Medical education, *Health resources, Health planning, Health occupations, *Health manpower, Health manpower education, Health education, Guidelines, Foreign.

Information on the physician migration issue is provided and the forces which impinge upon total physician supply are emphasized. Foreign medical graduates (FMGs) have become recognized as a crucial component of the U.S. physician supply. With medical school enrollments increasing and graduate training programs expanding at a lesser rate, increased competition between graduates, both domestic and foreign, is expected. Several basic facts about foreign medical graduates are presented. The graduates are generally younger than U.S medical graduates, and are predominantly male. Over 50 percent practice in house staff or other full-time hospital positions, and over 90 percent practice in metropolitan areas of the U.S. New York, Delaware, Rhode Island, New Jersey, and Illinois attract far more than average proportions. A high percentage of FMGs pick anesthesiology, pathology, and physical medicine as specialties. FMGs have also had a passing rate of about 64 percent on State licensure examinations, far below the 94 percent rate of U.S. graduates. Tables are provided to show various data on source, training, and other facets of FMG's.

HRP-0001947/1GA PC$4.50/MF$3.00
Bureau of Health Resources Development, Rockville, Md.

Proceedings of the Area Health Education Center National Conference.
1973, 56p

Descriptors: Universities, United States, Schools, Organization theory, National government, Medical education, Interactions, Health resources, Health related organizations, Health manpower, Health manpower education, *Health education, Health care services, Financing, Coordination, Cooperation, Agreements.

The first National Conference on Area Health Education Centers (AHECs) was called by the Office of Special Programs, Bureau of Health Manpower Education. In the fall of 1972, the Bureau awarded 11 contracts establishing the AHECs under the provisions of the Health Manpower Education Initiative Awards Section of the Comprehensive Health Manpower Training Act of 1971. The purpose of the conference was to provide the 11 AHECs with a mechanism for sharing information on their activities and experiences on a person-to-person basis with counterpart personnel. In addition, the sponsors hoped the AHECs would form some communications linkages among themselves on a continuing basis. Finally, the Bureau hoped to stimulate a dialogue between the centers and itself. The opening remarks of the conference present an overview of AHEC program objectives and structure. Following this, the AHEC contractors make individual presentations. Perspectives of AHEC activities are discussed, as are Federal priorities with regard to the centers. Overviews of fiscal management, contracting, and audit procedures are presented. An evaluation of the AHEC program is followed by group discussion and reports on the aforementioned topics.

HRP-0001969/5GA PC$5.00/MF$3.00
California Univ., Los Angeles.
Minority Health Manpower, Data: Problems and Questions.
Stephen M. Harmon. Apr 70, 83p

Descriptors: State regions, Quality assurance, Minority groups, Methodology, Medical personnel, Licenses, Job analysis, *Health resources, *Health manpower, Health care, Credentials, Certification, California.

Data on minority health manpower in the eight-county area of the Southern California Comprehensive Health Planning Council are presented. Data were gathered on 156 health occupations. Entrance and licensing requirements into these occupations, implications for minority health manpower, and suggested remedies are examined. Three data collection methods were used: library research, interviews, and letters. Problems encountered in the collection, including legal restrictions, problems of definition, and problems of orientation, are examined. Data relevance, acquisition, bias, and use are treated. Observations are made that society is unwilling to lower the standards of quality set for its health manpower, and that concessions to minorities will have to be made in entrance requirements to education and training programs to make up for past injustices. Programs must be created and tailored for minorities and include financial aid, cultural aid, and flexibility, as well as methods of recruitment, curricula, and teaching techniques designed to assure the desired quality while offering opportunity to minority groups.

HRP-0001971/1GA Not available NTIS
Social Security Administration, Washington, D.C. Office of Research and Statistics.
Health Insurance Plans Other Than Blue Cross or Blue Shield Plans or Insurance Companies. 1970 Survey.
Research Rept. No. 35
Louis S. Reed, and Maureen Dwyer. 1971, 125p
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $1.30.

Descriptors: United States, Prepaid health care, *Health resources, *Health insurance, Health care delivery, Financing.

The results are presented of a 1969 survey of all private health insurance plans other than Blue Cross or Blue Shield plans or those sponsored by insurance companies. These plans are classified as: (1) community group practice; (2) community individual practice; (3) union group practice; (4) union individual practice; (5) private group medical clinic; (6) private group dental clinics; and (7) dental service corporation. Information pertinent to each plan, its enrollment and services covered, personnel and facilities, geographical distribution, finances, arrangements for drugs and eyeglasses where applicable, and changes and trends from 1943 to 1968 is given. Appendix A provides a directory of health plans. Appendix B is the questionnaire and survey letter. Appendix C is a description of nine large community group practice plans. State and regional plan enrollment, by State of plan headquarters and of enrollee residence, enrollment for special benefits of persons under age 65 by State of residence, and six plans from Puerto Rico are the subjects of Appendices D, E, and F.

HRP-0002024/8GA PC$4.50
North Dakota State Dept. of Health, Bismarck. Div. of Comprehensive Health Planning.
Summary Report of Manpower in Hospitals, 1969 for the State of North Dakota.
Jun 70, 68p

Descriptors: Supplies, Statistical distributions, Reserves, Physicians, Physician extenders, Physician assistants, Nurses, *North Dakota, Methodology, Medical personnel, Measurement, Inventories, Health resources, Health occupations, *Health manpower, Health care, Health care utilization, Forecasting, Distribution, Dentists, Demography, Communities, Allied health personnel.

The Division of Comprehensive Health Planning of the State Department of Health, in cooperation with the North Dakota Hospital Association, began a survey of member hospitals in 1969. This study assesses hospital manpower statuses and needs, indicates trends and projected manpower needs, and examines the distribution of hospital manpower. A questionnaire provides data by the number of beds and their utilization, by personnel per occupational category, and by health occupation training program. The data are presented by planning area, as well as on a State basis. The assessment of manpower levels and needs is accomplished through the data collected on personnel per occupational category. Results from this area also indicate the projected needs of personnel. The occupational category of nursing service included over half of all employees. A final set of data consisted of the urgent needs of personnel, which was empirically derived from the data on personnel by occupational category. Portions of this document are not fully legible.

HRP-0002046/1GA PC$4.00/MF$3.00
Kentucky Nurses Association, Louisville. District One.
Nursing in Region 6.
1970, 35p

Descriptors: Supplies, State regions, Reserves, Registered nurses, Personnel development, *Nurses, Nurse aids, Methodology, Medical personnel, Measurement, Licensed practical nurses, Kentucky, Inventories, Health resources, Health occupations, *Health manpower, Health manpower education, Health education, Health care, *Health care requirements.

The status of nursing service and nursing education in Region VI, Kentucky is reviewed. Surveys of available nursing manpower indicate that demands for nursing personnel are not being met. There has been a decrease in the number of nurses prepared for practice since 1968 and an increase in population and health facilities. The career ladder concept in nursing education must be supported in nurse education. Consequently, the following recommendations are made: (1) efforts should be directed toward increasing career incentives and work satisfaction to influence recruitment and retention of nursing personnel, as well as to determine barriers to increasing the supply at the baccalaureate degree level; (2) hospitals administering schools of nursing must be supported to continue their programs, and the one existing State tax-supported practical nurse program in the region must be continued rather than initiating new programs; (3) education for nurses' assistants should be short, intensive programs implemented by vocational educational institutions; (4) Federal, State, and local tax support must be solicited to support nursing education at all levels; (5) the Kentucky Nurses' Association, District One, colleges, hospitals, and community agencies must pool their contributions in cooperative continuing education programs for nurses in the region.

HRP-0002052/9GA Not available NTIS
Harvard Medical School, Boston, Mass. Dept. of Preventive and Social Medicine.
Patient Needs and Medical - Care Planning: The Coronary - Care Unit as a Model.
Bernard S. Bloom, and Osler L. Peterson. 1974, 7p
Pub. in New England Jnl. of Medicine v290 n21 p1171-1177 May 74.

Descriptors: State government, Standards, Reviewing, Quality assurance, Plans, Physicians, Patients, Methodology, Measurement, *Massachusetts, Local government, Inpatients, Indexes(Ratios), Health statistics, Health care, *Health care utilization, Health care requirements, Health care indexes, *Health care facilities, Health care delivery, Forecasting, Evaluation, Demography, Data, Criteria, Communities, Assessments, Acute care.

Massachusetts demographic data and myocardial infarction incidence rates were used to propose a regional system of coronary care units. Using Framingham Heart Study (1970) incidence data for acute and serious heart disease, it is suggested that 5.6 million people can be served by 39 coronary care units with 336 beds. The proposed 39 units would be distributed so that every patient would be no more than 30 minutes from a unit and would have a 95 percent chance of obtaining a bed in the closest unit. The basis for the proposal is that few patients with infarctions will be treated by the average physician due to the incidence of sudden death and subclinical infarctions; that treatment in coronary care units reduces death rates; and that the units are not being operated economically or effectively. Published criteria for the system include organized units with a cardiologist director, 24-hour physician coverage, a minimum of six beds, well-trained personnel, and adequate facilities and equipment. A remaining problem is acceptance by the practicing community physicians, whose voluntary transfer of control to the cardiologist in cases of myocardial infarction is essential to success.

HRP-0002055/2GA Not available NTIS
Bureau of Health Resources Development, Bethesda, Md. Div. of Manpower Intelligence.
Foreign Medical Students in the Americas: 1971-72.
Dec 73, 36p DHEW/HRA-74/27
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.55.

Descriptors: United States, Statistical distributions, Medical education, *Health resources, Health manpower, Health care, Foreign, Distribution, Demography, Communities.

Data collected by the Pan American Health Organization on foreign medical school enrollment in the Americas for the 1971-1972 academic year are presented. Medical schools were surveyed via questionnaire on student enrollment by country of origin, sex, and year of study. Results are presented with emphasis on U.S. born students in other countries of the Americas and on foreign medical students in the U.S. The three countries with the greatest number of foreign students were Mexico, Argentina, and Brazil, followed by the U.S. and Canada. Argentina had the largest proportion of foreign students in its medical school enrollments (10 percent), while foreign students were 7.8 percent of the total enrollment in Mexico and only 2.5 percent in Brazil. Brazil had 73 medical schools surveyed, while Mexico had 23, and Argentina 9. The U.S., with the largest number of schools (108), ranked fourth in numbers of foreign students (735).

HRP-0002058/6GA Not available NTIS
Rochester Univ., N.Y. Dept. of Pediatrics.
Impact of Medicaid and an OEO Health Center on Use of Dental Services in an Urban Area.
Klaus J. Roghman, and Elbert A. Powell. 1974, 5p
Pub. in Public Health Reports v89 n4 p325-329 Jul-Aug 74.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, New York, Health care, *Health care utilization, *Dental services, Demography, Communities.

Changes in social class differentials in the use of dental health services in an urban community in upstate New York from 1967 to 1971 are examined. Socioeconomic status (SES) differentials are assessed by comparing utilization patterns of respondents living in different areas of the county. Findings on the percentage of children aged 3 years and over and mothers who visited a dentist during the preceding 12 months indicate a decrease in visits from children in the lowest and highest SES groups and a lesser increase in visits from the mothers. An increase is noted in the proportion of public clinic visits made by low income groups. Despite declines between 1969 and 1971, following increases between 1967 and 1969, the increases were still substantial. The 1969 increases may be ascribed to the large numbers eligible for Medicaid benefits up to April 1968, before the first change in State Medicaid legislation; the high percentage of persons applying for Medicaid and receiving dental care; and the accessibility of dental services at neighborhood health centers (NHCs), as well as expanded hospital-based dental programs. The 1971 declines may stem from changes in Medicaid legislation, reducing the number of eligible persons, and the scope of services and reimbursement schedule of private practitioners. SES differences in utilization rates persisted throughout the period, although the NHC and expanded hospital and Medicaid programs had some effect on use by low income persons.

HRP-0002211/1GA Not available NTIS
Johns Hopkins Univ., Baltimore, Md. Dept. of Medical Care and Hospitals.
National and Regional Health Planning in Sweden.
Vincente Navarro. 1974, 262p DHEW/NIH-74/240
Grant PHS-HS-00110
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $2.55.

Descriptors: Systems, Plans, Methodology, *Health planning, Health care delivery, *Health care delivery systems, Foreign countries, Development, Data acquisition.

This monograph details the health delivery system in Sweden. The elements of government are discussed, with the focus on administrative relationships at both the national and local levels. The Swedish social security health insurance and health service systems are examined. The report also covers the national and regional planning processes and long-term planning and budgeting for the health sector at the regional level, as well as the planning roles of the Cabinet and Parliament, of regulators and controllers, of data collectors, and of data analyzers. The final part of the report deals with points of possible relevance of the Swedish experience to the U.S. It emphasizes the relationship between the health insurance system and health care delivery and the infrastructure required for the process of national health planning. Tables and schematic representations accompany the text.

HRP-0002322/6GA PC$5.50/MF$3.00
Florida State Dept. of Health and Rehabilitative Services, Tallahassee. Bureau of Comprehensive Health Planning.
Florida Planning Study for Improved Delivery of Health Services to the Medically Indigent.
Jun 72, 102p

Descriptors: Vital statistics, Research, Medical services, Health resources, Health care, Health care requirements, Health care facilities, *Health care delivery, *Florida, Demography, Communities.

In March, 1971, the Secretary of Florida's Department of Health and Rehabilitative Services appointed a steering committee to study problems associated with delivering health services to Florida's needy population, and to make recommendations for improving the health care delivery system. The complexity and dimensions of the health crisis are outlined in this report, and objectives for assessing policy in the financing and organization of the State's health care are provided. The recommendations stem from an analysis of the socioeconomic characteristics of the existing population, its relevant health care problems, and the allocation of the total health resources in the State. The socioeconomic characteristics of Florida are discussed and the fragmented nature of the health care delivery system is outlined. Also examined is the lack of primary care services. It is stated that hospitals are generally highly autonomous and not involved in the total health needs of the community. In addition, there is inadequate availability and accessibility of health services in Florida's medically underserved areas. It is recommended that Florida should simultaneously improve the organization, delivery, and financing of health care, and strive to contain more directly the escalation in health care costs and to upgrade the quality of health care. An appendix contains population, income, and migrant characteristics of Florida, as well as statistics on Medicaid and Medicare recipients by county and region for 1970.

HRP-0002347/3GA PC$4.00
Vermont Univ., Burlington. Dept. of Community Medicine.
Ambulance Service in Vermont.
Julian A. Waller, and Lee Jacobs. 1970, 50p

Descriptors: *Vermont, Research, Plans, Health care services, Health care delivery, *Emergency medical services.

The Vermont Department of Health program to improve the quality of ambulance and related prehospital emergency services is described, and the status of such services as of early 1970, and any changes occurring that year are examined. Almost a quarter of the State's highway fatalities died of definitely or possibly survivable injuries. Vermont's small ambulance services handle emergencies infrequently, and are unable to maintain an adequate knowledge and skill level. During the day, 69 percent were on the road 10 minutes following a call for services, and at night this figure dropped to 49 percent. Fewer than five percent of ambulance personnel could be considered highly qualified. Recommendations included: improved training for personnel and improved equipment for ambulances, and a new Department of Transportation grant formula covering emergency services for nonresident travelers. Voluntary compliance previously led to improved services, and such cooperation was recommended to help correct noted deficiencies. The ownership and patterns of service, economics, personnel, equipment, reported needs, and a classification of ambulance services based on staffing and equipment also were discussed. Vermont ambulance legislation and ambulance information appear in appendices.

HRP-0002412/5GA PC$4.00/MF$3.00
Pennsylvania Governor's Budget Office, Harrisburg. Program Audit Div.
Medical Care Policy and the Right to Good Health in Pennsylvania.
Harry Cancelmi. Nov 72, 30p

Descriptors: Political science, Policies, *Pennsylvania, Objectives, Methodology, Legislation, Law(Jurisprudence), Health planning, *Health care, Health care delivery systems, Guidelines.

This report investigates the concept of the 'right to good health' and examines Pennsylvania statutes which define the limits of the State's obligation to protect an individual's good health. Twenty-five State policies about medical care are briefly outlined. Specific rights to care from hospitals, physicians, and State facilities are discussed, with references to past court rulings where available. The report also discusses proposed State legislation concerning pharmaceutical services. It is concluded that there is no established constitutional, statutory, or legal right to good health or adequate health care. The limited obligations of the State to individuals arise from policies and programs under statutory enactments. Debate arises from the desired balance between the State's role in protecting the community's health and the individual's responsibility for his own health and life. Opposition to the development of a government regulated industry in a nominally market-oriented system is another source of conflict.

HRP-0002461/2GA Not available NTIS
State Univ. of New York Upstate Medical Center, Syracuse.
Impact of a System of Computer-Assisted Diagnosis. Initial Evaluation of the Hospitalized Patient.
Jerry R. Wexler, Phillip T. Swender, Walter W. Tunnessen, and Frank A. Oski. 1974, 3p
Pub. in American Jnl. of Diseases of Children v129 p203-205 Feb 75.

Descriptors: Methodology, Health care, Health care technology, Diagnostic agents, Diagnosis.

The results of a study conducted to determine if the use of MEDITEL, a computer-assisted system of diagnosis, would affect the time required to reach a diagnosis or reduce the number of laboratory tests and consultations required to reach a diagnosis are reported. A total of 67 patients admitted to the pediatric service of the Upstate Medical Center, Syracuse, New York whose diagnoses were not clearly established at time of admission were included in the study. The study group was di-

vided, with 33 in the control group, and 34 in the experimental group. Physicians completed histories, physicals, differential diagnoses, and other tasks for each group. The MEDITEL form of findings was completed and a differential diagnosis printout was obtained. Within 24 hours the physicians in charge of the experimental group received the MEDITEL printout; the printout was not available to the physicians in charge of the control group. Results suggested that MEDITEL was as effective as the physician in considering the correct diagnosis when the system was employed upon a patient's admission to the hospital. The computer diagnosis remained unchanged for patients whose conditions were diagnosed before, or after 48 hours, while the physicians' diagnostic ability decreased with the time lapse. The study did not demonstrate the reduction of time required for ultimate diagnosis, the number of consultations requested, or the number of laboratory tests ordered to establish a final diagnosis.

HRP-0002780/5GA Not available NTIS
Law of Hospital Liability.
Arthur F. Southwick. 1970, 12p
Pub. in Legal Medicine Annual p91-114 1970.

Descriptors: Quality assurance, Physicians, Patients, Legislation, Law(Jurisprudence), Inpatients, Health resources, Health care, Health care facilities, Health care delivery systems, Acute care.

Limits of legal responsibility imposed upon the private nonprofit community hospital are discussed, with focus upon the duties owed the patient or visitor in jurisdictions which have removed all charitable immunities. The broadening concept of corporate responsibility for standards of patient care is discussed, and a trend toward national standards of care for both physicians and hospitals is identified. The concepts of corporate negligence and vicarious liability are discussed; both theories of liability, it is noted, have been expanded by judicial decision. The basis for application of the latter theory is the right of the employer to control the activities of the employee. In the hospital setting, this raises questions of the existence of an employment relationship and the right of control with respect to an employee's responsibilities. In corporate negligence, although human error or omission is involved, the hospital itself, as an entity or a corporate institution, is negligent, and liability attaches itself directly to the hospital. It is noted that, vicarious liability aside, the hospital as an entity historically has had no duty to care directly for the patient. The most significant legal decision with regard to the issue of whether the hospital as a corporate institution has a direct duty to furnish or provide for competent medical care is cited as Darling v. Charleston Community Hospital. It is concluded that the impact of the Darling case is that it calls attention to the need for organized medical staff willing and able to account to itself and to the hospital for standards of care. Legal citations are included.

HRP-0003172/4GA Not available NTIS
Public Health Service, Bethesda, Md. Div. of Nursing.
Research on Nurse Staffing in Hospitals. Report of the Conference.
Eugene Levine. May 72, 198p DHEW/NIH-73/434
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $2.35.

Descriptors: Productivity, *Nurses, Methodology, Medical personnel, Measurement, Health occupations, Health manpower, Health care, Health care utilization, Health care requirements, Data processing systems.

Proceedings of the Conference on Research on Nurse Staffing in Hospitals, sponsored by the Division of Nursing, Public Health Service, DHEW, and held in Fredericksburg, Virginia, May 23 through 25, 1972, are reported in a companion volume to a comprehensive critique of nurse staffing methodology published by the Division in January 1973. The conference brought together 45 persons from a variety of disciplines, all with experience in nurse staffing research. An opening presentation provides an overview of nurse staffing research, and ten papers discuss variables considered significant in influencing the quantitative and qualitative demand for nurse staffing. These variables include: patients' requirements for nursing services; architectural design of the hospital; administrative and cost factors; and social - psychological factors. In addition, papers are presented on evaluation of the quality of nursing care and on the impact of computerized information systems on staffing. Transcriptions of discussions following each presentation are provided. The report closes with a summary and synthesis of the conference proceedings, and comments on future direction for nurse staffing studies. Summaries of conference task force recommendations concerning future directions for research on nurse staffing in hospitals are appended.

HRP-0003175/7GA PC$7.75/MF$3.00
Public Health Service, Bethesda, Md. Div. of Nursing.
Planning for Nursing Needs and Resources.
Apr 72, 204p DHEW/NIH-73/87

Descriptors: Technical assistance, Strategy, Sources, *Nurses, Methodology, Medical personnel, Measurement, Management methods, Health related organizations, *Health planning, Health planning agencies, Health occupations, Health manpower, Health care, Forecasting, Development, Data, Data acquisition, Availability.

Basic guidelines and elements essential to effective planning for nursing are presented and principles and procedural methods for meeting a variety of changing conditions are discussed. These guidelines are primarily intended for use in planning for all fields of nursing service, nursing education, and nursing personnel within designated geographic areas. Topics dealt with include the nature of planning, initiating planning, building an organizational structure, strengthening the organizational structure, assessing needs and developing the plan of action, factfinding, and assessing requirements for nurse manpower. Schematics illustrate organizational structures for situations in which: a task force has policy-making responsibility; a steering committee has policy-making and executive responsibilities; a single top level committee or commission has combined advisory and policy-making responsibilities; and a council has executive, policy-making, and advisory responsibilities. An organizational structure also is provided for areawide planning and simultaneous planning for subareas or regions. Appendices present lists of guides to planning with short summaries of each listing. Included are survey and study reports, background material and tools for planning, and a guide to statistical data.

HRP-0003190/6GA PC$4.00/MF$3.00
Public Health Service, Bethesda, Md. Div. of Nursing.
Interagency Conference on Nursing Statistics. Abstract of Studies.
Jun 74, 31p

Descriptors: Research, Registered nurses, *Nurses, Methodology, Health resources, Health occupations, Health manpower, Health care, *Health care delivery, Data collection, Data acquisition.

Abstracts are presented of studies conducted or funded by the Interagency Conference on Nursing Statistics, an informal association of statisticians whose core group represents the American Nurses' Association; the National League for Nursing; the American Hospital Association; the American Medical Association; and the Divisions of Nursing and of Manpower Intelligence of the Public Health Service, DHEW. The 24 studies described relate to nurses, nursing students, or the systems within which nurses practice. Those studies not conducted on an ongoing basis were scheduled for completion in 1974 or 1975. Each abstract includes a brief description of the scope of the study, an outline of the methodology used, and indication of the expected date of completion and of publication plans. A list of source books on nursing data and a selected list of other sources of data related to nursing accompany the abstracts.

HRP-0003198/9GA PC$4.00
Georgetown Univ., Washington, D.C. Health Policy Center.
Health Programs in the States: A Survey.
Gary J. Clarke. Mar 75, 44p
This document is number six of the Eagleton Inst. of Politics Series on State Legislatures and Public Policy.

Descriptors: United States, Regulations, Private organizations, Private institutions, Plans, Methodology, Mental health care, Measurement, Health resources, Health related organizations, Health maintenance organizations, Health care, *Health care delivery, Health care delivery systems, *Health care costs, Family planning, Emergency medical services.

Presented is information concerning the construction of facilities, regulation of insurers, the legality of health maintenance organizations, financial aid for the needy, the provision of mental health services, new health professionals, emergency medical systems, regulation of occupational safety, the quality of service of clinical laboratories and blood banks, and family planning programs. Primarily addressed to policy-makers and their staffs, as well as those who may be approaching problems in State health care delivery for the first time, this survey concentrates on programs related to health care delivery and cost control problems, and is therefore representative of those programs only. Each chapter first places in historical perspective a particular program or statute and the health problem addressed, and then summarizes more recent developments. Accompanying tables compare primarily statutory variations in the programs selected among the 50 States. References are included at the end of each chapter to serve as starting points for further study. Portions of this document are not fully legible.

HRP-0003260/7GA PC$5.00/MF$3.00
Indian Health Service, Rockville, Md.
Indian Health Trends and Services. 1974 Edition.
1974, 87p DHEW/HSA-74/12009

Descriptors: Vital statistics, United States, Mortality, Morbidity, *Health status indexes, Health statistics, Health care, Fertility, Demography, Data, Communities.

Trends and information about the demographic characteristics and health status of American Indians and Alaskan Natives are summarized. Natality and morbidity statistics used in this report, compiled by the Indian Health Service, are based on the 85 percent of the Indian and Alaska Native population living in the 24 Reservation States. Health improvements and increased use of health services between 1955 and 1971 are itemized in chart form. During this period, the infant death rate declined 62 per-

cent, the death rate from diarrheal diseases declined by 85 percent, tuberculosis deaths decreased by 86 percent, and the death rate from certain causes of mortality in early infancy decreased 81 percent. A significant trend was increased acceptance of health care services by Indians and Alaskan Natives. Hospital admissions doubled, outpatient visits increased five-fold, and dental services quadrupled. A listing of new facilities constructed and alterations of existing facilities is presented. Health personnel assigned to programs have increased significantly. Running water and waste disposal systems have been provided for over 78,000 Indians and Alaskan Natives. Tables present detailed data of health services, statistics, and costs.

HRP-0003302/7GA PC$4.50/MF$3.00
Ohio Comprehensive Health Planning Advisory Council, Columbus.
Ohio Environmental Health Manpower Planning System: Consultant's Report.
James D. Williams. 1 Jul 74, 56p

Descriptors: Strategy, Projects, Project planning, Plans, *Ohio, Methodology, Health resources, *Health planning, Health occupations, Health manpower, Health care delivery.

Design and development of the Ohio Environmental Health Manpower Planning System are documented. All programs dealing with environmental health are matched with their ecological bases, reflecting the system's programmatic and ecological emphasis. The Office of Comprehensive Health Planning lists all programs and program components involving environmental health, and assigns priorities to the topics they deal with. This information, which includes reports on manpower in accordance with definitions and topic determinations of the Council, provides the input necessary for health planning to be comprehensive and enables planners to determine gaps in manpower and programs. Basic manpower considerations involved with environmental health programs are discussed, as are the organization of health planning in Ohio, consultation activities in the development of the environmental health manpower system, and four specific sub-projects. It is concluded that a system for environmental health manpower planning in Ohio has been formulated, and partly developed and tested, which provides a means for comprehensive planning and the development of planning for education and training programs. Portions of this document are not fully legible.

HRP-0003346/4GA PC$6.75/MF$3.00
Saskatchewan Univ., Saskatoon.
Major Illness Episodes, Hospitalization, Obstetrical and Pediatric Care: A Study of Fifteen Rural Communities.
Bhopinder S. Bolaria. Jul 72, 174p

Descriptors: State regions, *Rural health services, Rural areas, Maine, Indexes(Ratios), Health status indexes, Health statistics, Health care, *Health care utilization, Health care services, Health care indexes, Demography, Data, Communities.

The findings of a study on major illnesses and hospitalization patterns among 1,044 families in 15 rural Maine communities are presented. Data obtained from personal interviews indicate that the low income families account for a large proportion of major illnesses and hospitalized illness episodes. In major illness situations, these families are most likely to contact their family doctor and are more likely to contact a general practitioner than a specialist. In almost one-fifth of the cases, the time lapse between first symptoms of the condition and the visit to a physician was from one year to five or more years. Approximately 37.8 percent of the mothers saw the physician during the third month of pregnancy and almost one-fourth saw the physician during the fourth month or later, despite the fact that many of the women suspected pregnancy much earlier. Most of the children were born in a hospital, usually in Maine Coast Memorial Hospital, Bar Harbor and Down East Community Hospitals. The proportion of children not having some inoculations is high. Respondents are most likely to consult a physician for their children's high fever, prolonged cough, and itching rash. Appendix A provides supplementary tables related to respondent status and characteristics. Appendix B presents the questionnaires used in the study.

HRP-0003373/8GA PC$5.50/MF$3.00
Wisconsin Regional Medical Program, Inc., Madison.
Development of Sets of Patient Health Outcome Criteria by Panels of Nurse Experts. Final Report Project No. 7. January 1 - June 30, 1974.
Marie J. Zimmer, Norma M. Lang, and Doris I. Miller. 1974, 125p

Descriptors: Wisconsin, Statistical distributions, State regions, Registered nurses, Nursing, *Nurses, Methodology, Measurement, *Health resources, Health occupations, Health manpower, Health care, Health care utilization, Distribution, Demography, Communities.

Seven prototype sets of outcome criteria for seven specific critical patient populations were developed by nurse experts to serve as models for nurses, and eight to ten nurse experts were identified for each population. The group process used to generate the outcome criteria is described. In addition to development of patient health outcome criteria for very specific patient populations, objectives included increasing the number and distribution of Wisconsin registered nurses with experience in developing a set of outcome criteria as well as obtaining expert advice on adequate testing of sets of outcome criteria. Appendix I lists the resource personnel utilized in the study, and Appendix II presents information on each group session. Bibliographical data on all expert nurse participants is given in Appendix III. Seven Appendices provide the patient health outcome criteria developed for patient populations with (1) chronic obstructive pulmonary disease, (2) psychogenic depression, (3) an immobilizing physical disability, (4) essential hypertension, (5) cerebral vascular accident, (6) normal first pregnancy, post partum, and (7) toddlers with acute recurring otitis media. The consultation report on the testing of sets of outcome criteria is presented in Appendix XI.

HRP-0003423/1GA PC$4.50
Bluegrass Regional Health Planning Council, Inc., Lexington, Ky.
Plan for Personal Care, Intermediate Care, and Family Personal Care Home Facilities in the Bluegrass Region. (Revised 1975).
28 Apr 75, 58p

Descriptors: State regions, Patients, *Long term care, Kentucky, Inpatients, Health care utilization, Health care services, Health care facilities.

Guidelines for determining bed needs for personal and intermediate care, and for family personal care homes in the Bluegrass Region of Kentucky are delineated. For personal care, bed need estimates will be based on four beds for each 100 persons aged 65 or older, and for intermediate care, on two beds for each 100 persons aged 65 or older. No new construction will be approved for additions to a substandard facility until it meets applicable standards or a plan for a phasing out of the old facility has been approved. Minimum expected service populations for facilities are described and Health Planning Council requirements are outlined. A family personal care home provides 24-hour protective and personal care services in a residential accommodation for two or three individuals who, because of an impaired capacity for self-care, want or require protective living accommodations, but do not require constant medical care or skilled nursing services. Residents of these homes are mobile in that they are not bedfast, and can walk without the attention of another person. Bed needs for family personal care homes will be based on one bed per 100 persons aged 65 or older, and assigned to medical service areas by prorating shares of the total allocation of beds by population estimates. A series of tables provide statistical data. Portions of this document are not fully legible.

HRP-0003459/5GA PC$5.00/MF$3.00
Erling Helland Associates, Tulsa, Okla.
Operation, Regulation, and Financing of Ambulance Services in Tulsa, Creek, and Osage Counties.
Thordis Helland. Jul 73, 77p

Descriptors: Transportation, State regions, Oklahoma, Health resources, Health care utilization, Health care services, Health care requirements, Health care facilities, Health care costs, *Emergency medical services, *Ambulances.

A report of a study of the operation, regulation, and financing of ambulance services in a three-county area of Oklahoma is presented, and an analysis of the feasibility of establishing an ambulance district to serve all or part of the area is provided. Background information on ambulance service planning efforts in the U.S. and Oklahoma is also presented. Supporting data and analysis deal with estimated and projected demand for ambulance service, identification of political and economic factors affecting alternative actions, definition of operating and financing problems, and analysis of alternative solutions. Federal, State, and local legal requirements are discussed. Population growth and density vary widely among subregions of the area, with the city of Tulsa, Oklahoma containing 70 percent of area residents. Time of response and average number of ambulance calls are compared among subregions. Following a review of general problems, proposed solutions are discussed. These solutions concern financing alternatives, fee collection, recordkeeping and planning, time response in rural areas, hospital emergency facility locations, and operation responsibility. Recommendations and a proposed schedule of action are presented. Portions of this document are not fully legible.

HRP-0003463/7GA PC$5.00/MF$3.00
Tulsa Area Health and Hospital Planning Council, Okla.
Regional Collaboration to Achieve Maximum Patient Flow Efficiency: Demonstration Project.
Oct 71, 91p
Contract PHS-HSM-110-70-323

Descriptors: Research, Oklahoma, *Medical services, Health care requirements, *Health care delivery.

Factors inhibiting and affecting patient flow, and changes which would improve the flow among providers of health services are discussed. The flow problem is characterized by long delays or inability to secure appointments, long waits in waiting rooms, limited appointment time, difficulty in obtaining care on nights and weekends, and unavailability of beds in one hospital while beds are empty at another. The Tulsa region's health facilities and agencies are described in the study. Many of the obstacles to patient flow are subsequently examined, including legal, administrative, transportation, professional, and consumer

knowledge barriers. Certain basic inequities in the health care system are discussed. These concern lack of facility sharing, costly duplication of facilities, and 'flow gaps' in particular elements of the health care system. Several ideas for prompting cooperation between resources are also presented, and recommendations are made to correct the gaps in the health care system. The priority is given to development of adequate transportation to and between health services, and to consumer information and involvement programs. Appendices provide information about licensing of health manpower and facilities, and a bibliography.

HRP-0003909/9GA PC$4.00/MF$3.00
Community Service Council, Inc., Birmingham, Ala. Community Health Planning Commission.
Survey of Health Manpower Training Programs in Region III, Alabama. Blount, Chilton, Jefferson, St. Clair, Shelby and Walker Counties.
Jun 75, 37p

Descriptors: Universities, Students, State regions, Schools, Registered nurses, Physicians, Physician extenders, Physician assistants, Nurses, Medical education, Licensed practical nurses, Health resources, Health related organizations, Health manpower, *Health manpower education, Health education, Financing, Dentists, Curricula, Allied health personnel, Alabama.

All health manpower training programs in Region III of Alabama were surveyed in mid-February, 1975; a total of 62 program directors were contacted through a mail-out survey, and follow-up phone calls and visits were made to secure response from all programs. A copy of the data collection form is included. Data presented include name of health manpower training program, sponsoring institution, program director, entrance requirements, length of programs, estimated expense, availability of financial aid, and type of certification or degree granted. Almost all the programs reflect a recent increase in cost to the student. An additional breakdown on length of education training programs for 31 different professions and allied health occupations in the six-county area is provided. Student enrollment information is listed, and capacity, dropouts, graduates, applicants reported and not accepted, and faculty for each program are also shown. The number of educational training programs for health manpower in the Nation, State, and Region III is shown and student capacity is listed for each program. Major health professions and the 24 AMA-accredited programs in allied medical occupations are listed. Region III, which contains Birmingham, Alabama, serves as the training center for Alabama and, in some cases, for the southeastern region for 21 different occupations for which programs are not offered elsewhere. A breakdown by city location of the various programs is included. American Medical Association guidelines for development of new health occupations are presented.

HRP-0003935/4GA Not available NTIS
Appalachian Regional Center for the Healing Arts, Inc., Johnson City, Tenn.
Regional Nursing Home Bed Need Plan.
Oct 74, 34p
Grant PHS-04-P-0000-44-03-2
Available from ARCHA, P.O. Box 3520, Johnson City, Tenn. 37601, $15.00.

Descriptors: Tennessee, State regions, Rural health services, Rural areas, Patients, Methodology, Measurement, Long term care, Inpatients, Health resources, Health care, Health care services, *Health care requirements, Health care facilities, Forecasting.

A plan is presented for determining bed needs of nursing homes in the eight-county upper east Tennessee region served by the Appalachian Regional Center for the Healing Arts (ARCHA). The plan is provided as a guide for reviewing and evaluating future nursing home needs, based on a regional nursing home study and a patient origin study conducted by ARCHA staff. A patient demand forecasting formula is described which takes into consideration nursing home user characteristics rather than past utilization figures alone. The method is broken down into need and demand elements. Application of the formula is described in detail, and bed need forecasts (by county) for 1977 and 1980 are presented in tables. Work sheets used in deriving the figures for each county are included. It is recommended that alternative methods of care for the aged (homes for the aged, day care centers, homemaker and home health aide services, etc.) be developed to alleviate existing and projected demands for nursing home beds and to provide supplemental levels of care. A glossary and bibliography are included. Portions of this document are not fully legible.

HRP-0003936/2GA PC$5.00/MF$3.00
National Inst. of Mental Health, Rockville, Md. Office of Program Planning and Evaluation.
Issues in the Development of Statistical and Epidemiological Data for Mental Health Services Research.
Morton Kramer. 1974, 86p
This paper was developed for presentation at the World Psychiatric Association Symposium at the University of Teheran, Iran, in May, 1974.

Descriptors: Vital statistics, Sources, Morbidity, Methodology, Health status indexes, Health statistics, Health care, Demography, Data, Data processing, Data analysis, Communities, Availability.

The role of statistics and epidemiology in mental health services research is discussed by the acting director of the Biometry Division of the National Institute of Mental Health. The application of planning processes to mental health services through a program of mental health services research is outlined. The uses of epidemiologic data on mental disorders and statistics on the patterns of use of mental health services in conducting this research i.e., historical studies of patterns of use of psychiatric facilities, determination of extent to which services are meeting needs, estimates of numbers of mental health personnel, and determination of relationship of household composition to patterns of use of community mental health services are described. The importance of establishing well staffed research units with stable funding is emphasized. A series of problems are identified, the solutions to which would help close the gaps between existing and needed information. Among the areas of need identified are: determination of the prevalence and incidence of mental disorders; determination of extent of need for psychiatric services; factors affecting patients' use of facilities; automated mental health information systems for psychiatric facilities; information on mental health services delivered by mental health professionals in private practice and by family physicians, internists, and other medical specialists; establishment of classifications for producing uniform data for planning and evaluation; cost effectiveness research; development of social indicators; and other areas. A bibliography and supporting tabular data are included.

HRP-0004156/6GA Not available NTIS
American Medical Association, Chicago, Ill. Center for Health Services Research and Development.
Evolving Medical Care Firm and Its Impact on the AMA.
James Cantwell, Barry Fisenberg, and Richard Odem. Feb 75, 77p
Available from Helen Enos, Data Center, American Medical Association, 535 N. Dearborn Ave., Chicago, Ill. 60610, single copy free.

Descriptors: Professional organizations, Private organizations, Private institutions, Physicians, Nonprofit, *Medical group practice, Health resources, Health related organizations, Health occupations, Health maintenance organizations.

The current status of the medical care firm -- the business organization from which most physicians derive their livelihood -- is described, and problems and opportunities which confront the firm are indicated. Two general models of the medical care firm are identified: the traditional model characterized by the sole proprietorship, fee-for-service solo practice, and the emerging model, characterized by group practice, with the small - scale group probably the predominant form. Though fee-for-service is the predominant method of patient payment, prepayment is also found in the emerging model, and utilization of allied health personnel is more extensive than in the traditional model. Examples of options which confront the physician are presented; threats and opportunities represented in these options are assessed. Examples include technological opportunities for substitition of allied health personnel for physician time, information technology, national health insurance, economies of scale, group practice, price controls likely to accompany national health insurance, and numbers of malpractice suits. Examples of constraints likely to be placed on the individual medical care firm, from such sources as government, consumers, private insurance companies, and hospitals, are discussed. Two major trends affecting the American Medical Association (AMA) status are identified: specialization and group practice and the resulting change in the AMA's traditional constituency; and emergence of competing spokesmen for the medical care firm (county medical societies, physician's unions, etc.). AMA alternatives include taking a role in writing Health Maintenance Organization legislation and continuing to work for minimization of restrictions on physicians under national health insurance.

HRP-0004299/4GA PC$4.50/MF$3.00
Comprehensive Health Planning Council for Northern New Jersey, Totowa.
Proceedings Summary Report: Health Professions Education Master Plan.
1973, 63p
This document details the Orientation Session of the Health Professions Education Master Plan held on February 10, 1973 at William Paterson College.

Descriptors: Vocational guidance, Universities, State regions, Schools, New Jersey, Medical education, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Continuing education.

Proceedings of a conference on the Health Professions Education Master Plan for northern New Jersey are presented by the New Jersey Department of Higher Education in conjunction with the Comprehensive Health Planning Council of Northern New Jersey. Position papers were presented in three areas of health care including: education; health care delivery; manpower and methodology; and regionalization and implementation. Each panel was composed of a higher education representative, a health care professional, an educator, a consumer, a moderator, and a recorder. Education panel members stressed the importance of acquainting junior and senior high school stu-

dents with the opportunities available in health care professions. The panel on health care delivery discussed the credentialing process of health professionals and para-professionals, and the difficulty of defining continuing education. The manpower and methodology panelists were critical of the Health Professions Education Master Plan and made several suggestions for improvement. The panel on regionalization and implementation discussed various questions of institutional jurisdictions and rights, what agencies would determine rules and procedure for implementation and evaluation, and they expressed concern for the quality of the educational process and product.

HRP-0004425/5GA PC$5.50/MF$3.00
Health Delivery Systems, Inc., St. Louis, Mo.
Summary Final Report of the Household Health Interview Survey.
Anita Mackie, and Priscilla Canny. Jun 74, 118p
Contract HSM-110-72-323

Descriptors: Surveys, State regions, Patients, Missouri, Methodology, Inpatients, Health status indexes, Health statistics, Health manpower, Health care, *Health care utilization, Health care facilities, Dental services, Demography, Data, Data collection, Data acquisition, Communities.

Findings of a household health interview survey are presented by Health Delivery Systems, Inc. (HDS), from a sampling of 1,643 families in St. Louis City, St. Louis County, and adjoining counties in eastern Missouri. Questions were asked about each member of the household. Many of the questions were mandated for use in all Experimental Health Services Delivery Systems (EHSDS) sites in order to make area comparisons. Questions included days of illness, health problems, physicians' visits, hospitalizations, health insurance, and demographic items. HDS added questions in the area of dental care, emergency care, and attitudes towards physicians. The report presents the methodology and a discussion of some of the results of the survey. Frequency distributions and tables generated from the survey also are included, as well as tables comparing some of the data with other EHSDS sites. A list of 15 significant findings is provided, and comparisons are made with the national average. Additional information is given in the appendix relating to sampling errors and statistical inferences in the project. A sample questionnaire and definitions of terms are also given.

HRP-0004435/4GA PC$6.00/MF$3.00
Washington State Office of the Governor, Olympia. Office of Community Development.
Health Planning Washington Style: A Resource Notebook for Local Officials on Public Law 93-641.
Jun 75, 126p

Descriptors: *Washington(State), Policies, Personnel management, Orientation(Training), Objectives, Methodology, Health related organizations, *Health planning, Health planning agencies, Guidelines.

An overview of P.L. 93-641 is presented in this resource notebook prepared for local officials of Washington State to assist them in developing a new health planning system. The first section explains the background of the Act; Section Two outlines the objectives of P.L. 93-641, the responsibilities outlined by the Act, organizational structures, and a national schedule for implementation. A description is given in Section Three of the method of designating health service areas, and proposed amendments supported by the State Governor are explained. The fourth section presents the objectives of engaging the community in public discussions for health planning, the actual development of the health planning system, and a State timetable for implementing the Act. Evaluative principles and policy issues are discussed in Section Five. Included here are considerations relating to consumer and provider participation in health planning, public accountability, sensitivity to metropolitan and nonmetropolitan health needs, and efficient use of planning and development resources. Eighteen questions are addressed pertaining to policy decisions and range from levels of decision-making, composition and skills of board members, and coordination of activities to processes for resolving differences between State and community. Each section is treated in detail, and in some cases, additional data are appended. Portions of this document are not fully legible.

HRP-0004509/6GA PC$4.00
Health Planning Association of Northwest Ohio, Maumee.
Translating Areawide Health Planning Agency Information Into Action Programs.
1974, 29p

Descriptors: Systems, State regions, Plans, Ohio, Methodology, *Health planning, Health care, Health care delivery, Health care delivery systems, Development, Data processing, *Data processing systems, Data collection, Data bases, Data acquisition.

A prototype comprehensive health data system for comprehensive health planning agencies is proposed by the Health Planning Association of Northwest Ohio. The scope of the program would be capable of developing the following elements in stages: (1) outpatient, preventative care, home health care, and ambulatory care; (2) inpatient, acute care, long-term care, convalescent care, and rehabilitation care; and (3) nonpatient, environmental influences, and socioeconomic conditions. A list of agencies contributing to the project's financing is included. The collection of data bank information is primarily from secondary sources. The proposed areawide data and research center would be operated for the benefit of 12 counties in northwest Ohio, and would undertake a continuous research process within the selected project area to determine the needs of citizens in the area. Steps for the development of the data and research center are outlined, and a data committee is described which is comprised of providers, consumers, and professionals from public and private agencies dealing with health problems. A number of these people have experience in data systems. Major priorities of the program would be the analysis and utilization of historical resources, with attention to major gaps especially in morbidity and hospital utilization, pilot studies on patient origin / utilization, and investigation and evaluation of population groups with special problems. Portions of this document are not fully legible.

HRP-0004670/6GA PC$3.50/MF$3.00
Association of American Medical Colleges, Washington, D.C. Task Force on Health Manpower.
Legislative Specification Report.
D. C. Tosteson. 10 Feb 75, 13p

Descriptors: Students, Retention, Recruiting, National government, Methodology, Health occupations, Health manpower, *Health manpower education, Health education, Financing.

Recommendations for a new health manpower training bill are presented by the Task Force on Health Manpower of the Association of American Medical Colleges. Specific recommendations are directed to: providing a basic level of capitation support to enable schools to maintain enrollment; to improve geographic distribution through increasing National Health Service Corps' scholarships and recruiting students from underserved areas; to improve specialty distribution through increasing primary care residencies in affiliated general hospitals and operating undergraduate primary care programs in ambulatory settings; and to remove the special preference status for foreign physicians in the immigration statutes. Recommendations for legislation authorizing Federal assistance to health professions education include capital support for construction, student assistance through loans and scholarships, and institutional assistance through capitation support in the areas of aggregate supply and geographic and specialty distribution. Suggestions for providing support to special projects range from interdisciplinary training among professions, training in the use of the problem-oriented patient record and the use of computer technology in health care delivery, to sensitivity training to the health problems of ethnic groups, older persons, females, and the handicapped. Other Task Force suggestions relate to the composition of membership in the National Advisory Council, and preferred and alternate advisory groups.

HRP-0005303/3GA Not available NTIS
Health Services and Mental Health Administration, Rockville, Md. Div. of Emergency Health Services.
First Hours Are Critical in Medical Emergencies.
Henry C. Huntley. 1971, 4p DHEW/HSM-73/2031
Pub. in Jnl. of the American Colleges of Emergency Physicians v1 n2 p13-16 Mar 72.

Descriptors: Policies, Objectives, Methodology, Health resources, *Health planning, Health care services, Health care requirements, Health care facilities, Guidelines, *Emergency medical services.

The case for improving and modernizing emergency medical care in the U.S. is presented. Almost two million deaths occur in the U.S. every year; of these, an estimated 60,000 could have been prevented through use of known rescue and resuscitation methods. The care provided during the first hour after the onset of the medical emergency is probably the most important. A primary need in any community is an alarm system to inform emergency service providers when and where an medical emergency occurs. A second element is the kind of assistance provided by the first person at the scene of the emergency. Many persons have received basic first aid training but are still unable to deal adequately with an emergency. The use of a universal emergency phone number is urged, such as the centrally dispatched system using 911. Existing ambulance equipment is said to be inadequate, with only a small percentage of ambulances having all the desirable equipment recommended by the National Academy of Sciences. Better paramedical training is needed, as well as clear roadside signs leading to emergency care facilities. Improved hospital emergency department equipment and more adequate staffing are needed. Areawide planning, categorization of emergency departments, and regionalization of emergency services and facilities are urged, as is a comprehensive review of emergency care funding.

HRP-0005360/3GA Not available NTIS
National Center for Health Statistics, Rockville, Md.
Cycle One of the Health Examination Survey: Sample and Response, United States - 1960-1962.
Tavia Gordon, and Henry W. Miller. Sep 74, 40p DHEW/HRA-75/1292
This document is number one in Vital and Health Statistics series number eleven (Data from the National Health Survey).
Available from the Scientific and Technical Information Branch, National Center for Health

Statistics, 5600 Fishers Lane, Room 8-20, Rockville, Maryland 20852, single copy free.

Descriptors: United States, Surveys, Sampling, Methodology, Measurement, Health status, Health care, Design, Data collection, Data acquisition.

Sampling procedures and estimating techniques employed in the first cycle of the Health Examination Survey (HES), the similarity between the sample and the universe it represents, and the impact of nonresponse upon the survey are described. The overall plan of the HES is to conduct successive, separate cycles of examinations concerning health information in specific segments of the national population. Data are collected by actual examinations of, and tests upon, individuals selected in the sample. In the process of defining the sample group, information about all sample persons is obtained prior to the examination by means of household interviews. The HES uses a nationwide probability sample of the population, making it possible to obtain the desired statistics efficiently and in such a manner that statistical reliability of results is determinable. These factors, together with the highly standardized and closely controlled measurement processes, are essential to the reliability of the survey. The first cycle involved an examination of a sample of adults, and was directed toward collection of statistics on the medically defined prevalence of certain chronic diseases and of a particular set of dental findings and physical and physiological measurements. The probability sample consisted of 7,710 of all noninstitutional, civilian adults in the age range 18-79 years in the United States. A total of 6,672 persons were examined from October 1959 to December 1962. This initial report does not deal with the survey findings as such, but rather describes the frame against which the findings are to be presented and indicates how survey data will be converted into estimates for the general population. The association of several selected demographic characteristics, including place, age, sex, and race, with variations in survey response levels is examined. Factors which could lead to bias in the survey findings are pointed out. Supporting tabular data and a bibliography are included.

HRP-0005538/4GA PC$3.50/MF$3.00
Southeast Georgia Hospital Association District, Augusta. Civilian MAST Coordinating Committee.
Procedures for Interhospital Transfers.
1975, 9p

Descriptors: South Carolina, Regions(United States), *Health resources, Health care facilities, Georgia, *Emergency medical services.

Suggested procedures for ordering and receiving MAST (Military Assistance to Safety and Traffic) interhospital transfers are outlined in this manual. The decision to order a MAST mission must be made by a physician familiar with the medical condition of the patient, based on the following criteria: transfer is needed to prevent death or aggravation of an illness or injuries; available ground transportation would cause a delay in treatment jeopardizing the patient's welfare; and satisfactory ground ambulance services and medical care en route are not available. The physician ordering the service must have absolute assurance that medical personnel and equipment will be ready to receive the patient at the destination. Before ordering a MAST helicopter, certain information must be ready including: names of requesting hospital and physician, location of pick-up, with site markings and obstacles to landing; name of law enforcement agency scheduled to be at the scene; data on number of patients and types of injuries and diagnosis, plus treatment and drugs given prior to transfer. Special equipment needed en route must be detailed, and weather at pick-up site described. Primary and alternate phone numbers are listed for ordering MAST service in the Fort Stewart, Georgia area. Details of arrangements to be made after the MAST mission has been ordered and approved are listed, together with information regarding loading of patient(s) on the heliocpter. Appendices present maps of Georgia and South Carolina counties covered by Fort Stewart MAST.

HRP-0005582/2GA Not available NTIS
Bureau of Medical Services, Hyattsville, Md. Div. of Emergency Medical Services.
Emergency Medical Services Systems Program Guidelines.
Feb 75, 67p DHEW/HSA-75/2013
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.85.

Descriptors: Regulations, Legislation, Law(Jurisprudence), Health resources, Health care services, Health care facilities, Health care delivery, Health care delivery systems, Financing, *Emergency medical services.

A policy statement is presented by the Health Services Administration of the U.S. Department of Health, Education and Welfare to assist applicants for funds available under the Emergency Medical Services Systems Act of 1973 (Public Law 93-154) in understanding the legislation, regulations, guidelines, and related administrative procedures. The document also familiarizes the applicant with application procedures, evaluation, and post-award project administration. After an opening discussion of program administration, eligibility and funding limitations and considerations are discussed. Special program guidance, such as emergency care issues, regionalization of emergency medical services (EMS), EMS system components, evaluation of EMS as a component of the total health care delivery system, and EMS system management, is offered. Application procedures are reviewed, and criteria for evaluation of applications under Sections 1202, 03, and 04 of the Act are outlined. Post-award administration is also discussed, and project changes such as costs, payments, income, credits, and refunds; accounting, records, and audit; reports and reporting requirements; and publication and publicity are briefly noted. Exhibits describe the A-95 review process and list regional offices; present the evaluation factors for applicatons submitted under each section of the Act; and quote Federal EMS regulations. A list of references is included.

HRP-0005604/4GA PC$5.00/MF$3.00
Southeast Idaho Council of Governments, Pocatello. Subarea Health Council Region V.
Health Systems Plan for Southeast Idaho.
Jul 75, 95p

Descriptors: Systems, State regions, Plans, Methodology, Idaho, *Health planning, *Health care delivery, Health care delivery systems, Development, Data acquisition.

The background and status of health planning in southeast Idaho are documented in the first health systems plan produced by the Subarea Health Council and sponsored by the Southeast Idaho Council of Governments. Purposes of the plan, the state of health of the region, and goals, objectives, and priorities are discussed in both general and specific terms, and evaluation and implementation guides are provided. Major goals set forth in the plan are: (1) provision of needed preventive diagnostic treatment, rehabilitation, and custodial care programs to assure the best possible physical and mental health for all citizens; (2) achievement of a quality environment conducive to good health; and (3) development of a basic, effective, and economical health delivery system available and accessible to all citiznes, with a comprehensive, coordinated, specialized health facility and delivery system within the region. The seven-county area for which the plan was developed is characterized as sparsely populated but united by geographic, social, cultural, economic, and political factors. The plan documents resources and needs in the specific areas of acute hospital care, special inpatient care, long-term care facilities, outpatient care, home health services, public health services, school health facilities, emergency medical services, environmental health services, mental health services, veterinary services, and allied health education. Appended documentation includes a resolution in support of the reorganization of the Southeast Idaho Health Planning Council to seek Subarea Health Council status, bylaws of the Subarea Health Council, the executive order establishing Idaho health service areas, and details of an attitude survey undertaken in the determination of goals and objectives. Supporting tabular data are included. Portions of this document are not fully legible.

HRP-0005628/3GA PC$4.00/MF$3.00
Bureau of Health Resources Development, Bethesda, Md. Div. of Manpower Intelligence.
Delineation of Economic and Health Service Areas and the Location of Health Manpower Education Programs. A Summary.
Feb 74, 36p
Contract PHS-72-4083

Descriptors: Utah, Strategy, South Dakota, Regions(United States), Montana, Methodology, Information systems, Idaho, *Health planning, *Health economics, Health care, Geocoding, Economics, Economic theory, Colorado.

Findings of a study to determine whether the economic system could be used effectively as a surrogate in health planning for the health - care delivery system, and to estimate the interrelationships of the health manpower education system with the economic system and the health - care delivery system are summarized. The methodology used 74 economic variables and 24 health - care delivery variables for the same intermountain geographic region characterized by rural conditions and low population density. It was found analytically feasible to identify a close relationship between the economic and health care systems in the region. Although the study did not involve the estimating of health needs and the use of time - series data, the empirical results indicated that: (1) the methodology provides meaningful models of the economic and health systems in the intermountain region; (2) the economic system data are easier to obtain than the health - care system data; and (3) given the close relationship of the two systems, the economic system has the potential of being a surrogate for the health - care delivery system. The potential also is suggested for using the economic system as a method for improving the quality of health planning, health manpower planning, and health manpower program and facility planning.

HRP-0005630/9GA Not available NTIS
Kellogg (W.K.) Foundation, Battle Creek, Mich.
Regionalization and Rural Health Care: An Experiment in Three Communities.
Walter J. McNerney, and Donald C. Riedel.
1962, 222p
Available from Univ. of Michigan, M2240, School of Public Health, Ann Arbor, Mich. 48104.

Descriptors: State regions, *Rural health services, Rural areas, Research, Patients, Michigan, Inpatients, Health occupations, Health manpower, Health care services, Health care delivery, *Ambulatory health care.

Three experimental regional health centers in rural, northern Michigan are evaluated in this report by the University of Michigan's Bureau of Hospital Administration. The origins and general concept of regionalization are studied, as are its slow growth and legislative backing. With funding from the W.K. Kellogg Foundation, in addition to State Hill - Burton agency financial assistance, the three small facilities were established. They included physicians' offices and from 10 to 19 inpatient beds. Financial management of the centers is discussed, and the composition of governing boards is outlined. Staffing and personnel management are described, as is the medical staff. The extent of regional relationships and of attitudes toward regional affiliation is explored, and utilization patterns (inpatient and outpatient emergency use and use of physicians' services) are noted. The community viewpoint of the centers is discussed in the context of use of health centers, community evaluation, and opinions of selected community leaders. Implications of the study are outlined, and limitations of the centers are noted. Selected references are furnished, and affiliation agreements and interview schedules are appended.

HRP-0005662/2GA PC$4.00/MF$3.00
National High Blood Pressure Education Program, Bethesda, Md.
Recommendations for a National High Blood Pressure Program Data Base for Effective Antihypertensive Therapy.
1 Sep 73, 29p DHEW/NIH-75/593

Descriptors: Strategy, Public health, Project planning, Methodology, *Health planning, *Health education, Health care services.

As one of four task force efforts directed toward development of a national high blood pressure education plan, the Data Base Task Force report presents recommendations for identifying that segment of the total population which is hypertensive, for separating out the smaller fraction which might benefit from therapy with antihypertensive drugs, and for proposing appropriate therapeutic regimens for this subgroup. The report proposes guidelines for a simple, large scale primary screening program designed to identify not only the majority of those subjects with significant hypertension, but also virtually all subjects with hypertension in the range where drug therapy can be expected to be beneficial. Guidelines for a secondary screening program of individuals identified as hypertensive at the primary screen are designed to identify subjects likely to need therapy, subjects requiring only routine periodic rescreening, and an intermediate group for which referral to a source of medical care is appropriate. The report also outlines specific antihypertensive drug regimens for appropriate groups of subjects, bearing in mind the recognition of the importance of individualized regimens, particularly among subjects with the most severe and mildest types of hypertension. A subject with a diastolic pressure of 95 mm Hg or more or a systolic pressure greater than 160 mm Hg should be referred for a secondary screen. At the secondary screen, the diastolic pressure should be chosen as the sole basis for disposition. Accompanying the detailed screening and therapy guidelines are flow diagrams for primary and secondary screens and for antihypertensive regimens. Dosage and time charts for medications and other drug data are included. Background and explanatory materials are appended.

HRP-0005716/5GA PC$4.50/MF$3.00
North Central Comprehensive Health Planning Association, Inc., Fort Collins, Colo.
Annual Implementation Plan of the Areawide Health Systems Plan for Colorado Planning and Management Region Two (Larimer and Weld Counties).
Aug 75, 66p

Descriptors: Systems, Strategy, State regions, Plans, Methodology, Implementation, *Health planning, *Health care delivery, Health care delivery systems, Development, Data acquisition, Colorado, Annual.

The 1975-1976 Annual Implementation Plan (AIP) for Larimer and Weld Counties, Colorado, is presented by North Central Comprehensive Health Planning Association, Inc., as Chapter VI of the region's first health systems plan. The AIP is basically a summary of the detailed health system plan sections, and is intended for wide distribution to health care providers and for use as a reference guide for health care planning in the region. An overview of the AIP is provided, and the planning process, goals and objectives, and purpose of the document are summarized. The health systems plan sections that have been completed by the agency and the State during the current year, and areas that are to be worked on in the next phases are identified. Several exhibits provide reference to specific service providers and to various plan sections and action recommendations. The progress and achievements of the agency during the past year and the impact that the National Health Planning and Resources Development Act of 1974 will have on the area are explained. The agency work program identifies the work schedule for the coming year and relates the schedule to manpower availability. Appendices summarize service goals and action recommendations for the following service areas: primary care, including freestanding ambulatory care centers; intermediate care, including acute inpatient services, long-term nursing care, emergency services, chronic renal dialysis, alcohol abuse, drug abuse, and mental health; and teritary care, including oncology and radiation therapy services. Action recommendations and / or commitments are also summarized by service provider and / or appropriate agency.

HRP-0005726/5GA PC$5.00/MF$3.00
South Plains Association of Governments, Lubbock, Tex.
Emergency Medical Service System Plan.
Jun 75, 81p

Descriptors: Texas, State regions, Plans, *Health care delivery, *Emergency medical services.

Plans to establish an emergency medical services (EMS) system in the 15-county South Plains State Planning Region are presented, with the objective of reducing death and disability by linking rural South Plains with the city of Lubbock, Texas where highly specialized care facilities and practitioners are located. Fragments of a system already exist, with every county possessing means to transport emergency patients to an emergency department, and most counties have at least one physician. The planned system would fill the gaps in the present network and improve the marginal components in existence. Tables present demographic information, business profiles, transportation characteristics, legislative characteristics, and health delivery system characteristics. Ambulance service is described in detail. A definition and justification of needs section is presented, together with a description of existing EMS communications. An inventory of health care personnel is given by county. The implementation approach to achieving planned objectives is outlined, and priorities are defined. An implementation schedule is provided together with a regional EMS system office budget and an equipment budget estimate. Portions of this document are not fully legible.

HRP-0005733/1GA PC$5.00/MF$3.00
Ohio State Univ., Columbus. Center for Human Resource Research.
Allied Health Manpower in Ohio. Employment Trends and Prospects.
Thomas N. Chirikos. 1972, 96p

Descriptors: *Ohio, Methodology, Medical personnel, Measurement, Health occupations, Health manpower, Health care, *Health care requirements, Forecasting, *Allied health personnel.

Allied health manpower employment trends and prospects in Ohio are presented in this reported prepared for the Ohio Advisory Council for Vocational Education. The report is intended to generate discussions of education and manpower policy requirements. The principle objective of the three-month project was to analyze the directions of change in health-related employment in Ohio over the next decade, and provide for the development of formal education and training programs in the allied health field. The analytic framework of the study is discussed, and sources and uses of data are explained. Backgrond information relating to two decades of allied manpower growth in the State is given, and employment in the health service industry is described. The division of labor within the field is estimated, since statistics on the occupational characteristics of health workers are difficult to obtain, but, to the extent possible, both occupational and geographical characteristics of health manpower distribution are detailed. A projection is made of the State's requirements for allied health manpower in the 1980s and occupational projections to 1985 are provided. Policy implications in several areas are examined and assessed.

HRP-0005754/7GA PC$4.00/MF$3.00
Oregon State Health Div., Salem. Office of Health Planning Services.
Guidelines for the Development of a County Comprehensive Health Plan.
Aug 74, 44p

Descriptors: State regions, State government, Policies, Plans, *Oregon, Objectives, Methodology, Local government, Health planning, *Health care delivery, Guidelines, Documentation, Development, Data acquisition.

The development of a format for a State comprehensive health plan in Oregon is discussed. The entire State of Oregon is first viewed as a planning jurisdiction and then in terms of developing plans for each areawide agency to meet specific needs. The State plan will be organized in two parts: (1) data and documentation to provide the basis for plan analysis; (2) short-range and long-range goals and objectives in a general framework for presentation to decision-makers. Formats for both parts of the plan are presented. The development of county plans is an integral part of the State plan, and procedures used to organize, develop, and assign people or agencies to the project are described. The development of a basic community profile is outlined, including geographic and demographic data, socioeconomic indicators and their source, environmental data and source, health status indicators and source, health facilities and services, manpower, and utilization. Methods of assessment for current programs are presented with examples, and jurisdictional concerns are considered. Maps and data collection sheets are provided.

HRP-0005789/3GA PC$4.00/MF$3.00
Montana State Dept. of Health and Environmental Sciences, Helena. Div. of Planning and Resource Development.
Montana State Plan for Health Summary.
Aug 73, 33p

Descriptors: State government, Plans, *Montana, Methodology, Local government,

*Health planning, *Health care delivery, Development, Data acquisition.

Problems discussed in the Montana State Plan for Health are listed and objectives and sub-objectives addressing each problem are enumerated. The following problems are considered: (1) lack of emphasis on preventive health services; (2) underestimation of health education as an integral part of the health care delivery system; (3) unavailability of primary and emergency medical services; (4) lack of a uniform minimum level of local public health services; (5) under-utilization of existing health resources; (6) lack of emphasis on home health care as an alternative to institutionalization; (7) lack of uniform strategy for assessing development and implementation of mental health services; (8) inadequate coordination of alcoholism and drug abuse planning and administration; (9) insufficiency of primary health care providers; (10) maldistribution of physicians and other health manpower; (11) inability of some areas to attract a resident physician due to insufficient population bases and / or lack of amenities for the physician and his family; (12) under-representation of racial minorities in the health professions; (13) inadequate coordination of health manpower utilization; (14) limited coordination of health facilities offering all levels of care; (15) uneconomic overlaps in existing services; (16) failure of National legislation to reflect needs of rural populations; (17) proliferation of environmentally related health problems; (18) unavailability of health services to off - reservation Indians; (19) inadequate health-related data; and (20) high cost of health care as a barrier to the receipt of medical services.

HRP-0005797/6GA PC$6.00/MF$3.00
Southeast Arkansas Economic Development District, Inc., Pine Bluff. Areawide Health Planning Program.
Southeast Arkansas Medical Facilities Plan.
1 Jul 75, 144p

Descriptors: Universities, State government, Schools, Plans, Patients, Mental health, Medical education, Long term care, Local government, Inpatients, Health resources, Health related organizations, Health manpower education, Health education, *Health care facilities, *Health care delivery, Arkansas, Ambulatory health care, Acute care.

The 1975 Areawide Medical Facilities Plan, to be used in conjunction with the Areawide Health Plan, is presented for the ten counties comprising the Southeast Arkansas Economic Development District. The area is essentially rural, and its residents tend to be far below average in income and education. The policies of the State Health Coordinating Council are discussed regarding a State Health Facility Plan, as well as national, State, and areawide priorities, and guidelines for proper identification of hospitals. A glossary and a general description of the planning district are presented. An inventory of medical facilities and services in the area is provided, including hospitals, nursing homes, ambulatory care facilities and services, mental health facilities and services, public health facilities and services, and health training facilities. Individual short-range and long-range plans of each existing facility in the above categories are described. The concluding remarks note that the plan has only reflected the utilization and status of the current health delivery system in the area and has provided only a few clues to the actual health needs in southeast Arkansas. It is concluded, generally, that needs are to relieve shortages, reduce duplication, replace or close obsolete facilities, and place more emphasis on preventive medicine practices. Supporting documents, sample survey forms used in gathering information from facilities, and long-term care and hospital bed need projections for 1980 using the Hill - Burton method are appended. Tabular data and maps are included. Portions of this document are not fully legible.

HRP-0005968/3GA Not available NTIS
National Center for Health Statistics, Rockville, Md.
Measurement and Application of Illness Costs.
Dorothy P. Rice. 1968, 7p
Pub. in Public Health Reports v84 n2 p95-101 Feb 69.

Descriptors: Vital statistics, Mortality, Morbidity, Methodology, Measurement, Injuries, Health care, *Health care costs, Handicapped persons, Diseases, Demography, Cost analysis, Communities, Ailments.

A procedure for measuring morbidity and mortality costs in a broad context is described, and the use of this estimating procedure in cost-benefit analysis is discussed. The measurement of illness costs involves the distribution of direct expenditures by disease categories and the development of a systematic framework for use in estimating annual losses in output and the present value of lifetime earnings lost as a result of death. When all these expenditures and estimated costs are added, the total economic cost of poor health in fiscal year 1967 was estimated at approximately $125 billion. The measurement of illness costs are applied and used in several cost-benefit analyses generated by the planning-programming-budgeting system within the Department of Health, Education, and Welfare. Alternative techniques to the use of mortality and morbidity measures include the translation of benefits into dollar terms. The major issues that result in differences in analytical procedures arise from the difficulty of measuring intangible benefits and varying values placed on different age groups. The translation of tangible savings into dollar benefits by cost-benefit analysis enables a decision-maker to consider them along with unmeasurable and nonquantifiable social and political benefits.

HRP-0006071/5GA Not available NTIS
National Inst. of Mental Health, Rockville, Md.
Census Data (1970) Used to Indicate Areas With Different Potentials for Mental Health and Related Problems.
1971, 35p DHEW/ADM-75/159
This document is number three in the Mental Health Statistics Series C (Methodology Reports).
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $.70.

Descriptors: United States, Statistical analysis, Sociology, Socioeconomic status, Socioeconomic factors, Methodology, Health status indexes, Health statistics, Health care, Demography, Data, Data processing, Data analysis.

The utilization of 1970 Census data to provide meaningful information about mental health area populations is discussed and illustrated. Demographic and ecological dimensions are presented that are useful in differentiating among residential subareas of American cities and that can be measured using available Census data. Particular emphasis has been placed on identifying areas with high risk populations, i.e., populations whose characteristics have been shown to be associated with high rates of mental illness and / or high incidence of social disorganization or disruption. A major emphasis of the report concerns social area analysis, the dimensions of which served as a primary baseline for selection of many of the 1970 Census items or variables. These social area analysis dimensions include social rank; life style; ethnic status; relevant area characteristics such as residential instability, feminine careerism, and area homogeneity; and specific indicators of high risk populations, including data on school dropouts, working mothers, aged persons living alone, disabled populations, and specific poverty groups. Four tables list available Census data indicators relative to each social area dimension identified. Application of these Census variables in health planning is illustrated through presentation of statistics for Dane County, Wisconsin. A bibliography is included.

HRP-0006090/5GA Not available NTIS
Hospital Survey Committee, Philadelphia, Pa.
Health Facility Planning Guide: Specialized Facilities for Burn Treatment.
Special Rept.
Dec 71, 16p
Available from the Hospital Survey Committee, Inc., 7 Benjamin Franklin Parkway, Philadelphia, Pa. 19103, $1.00.

Descriptors: Strategy, Revisions, Regions(United States), Project planning, Pennsylvania, New Jersey, Methodology, Health resources, *Health planning, Health care technology, *Health care facilities, Financing, Development, Design, Data acquisition.

The need for specialized burn treatment facilities in the Philadelphia - South New Jersey Metropolitan area is summarized. The types of care and facilities are explained according to the level of care offered: the burn unit, which should contain a minimum of six acute - care beds in a distinct facility within a hospital where patients are treated under the direction of a full-time experienced physician, and a burn center which provides more sophisticated care for the most critical cases and should contain 12-14 beds and offer teaching and research facilities. Determination of need is discussed, as well as design characteristics, special equipment, personnel and staffing, special services, operating costs, transportation and location of facilities. Types of facilities recommended for each district in the eight-county region are indicated on a map. Guidelines for planning include the following: by 1980 the Metropolitan area should have at least two burn centers in major teaching hospitals, and eight to ten burn units; at least one burn center and a minimum of four burn units should be in operation by 1975. The community should request the area's United Funds, Catholic Charities, Allied Jewish Appeal and other funds to coordinate a special effort, to support the renovations necessary to establish needed burn - treatment facilites, and to provide funds necessary to insure their continued operating feasibility.

HRP-0006096/2GA Not available NTIS
Tennessee Univ., Knoxville. Graduate School of Planning.
Citizen Participation in Planning: Selected Interdisciplinary Bibliography.
David E. Booher, and Mary Vance. Jan 75, 20p
This document is Exchange Bibliography number 718 of the Council of Planning Librarians.
Available from Mrs. Mary Vance, Editor, Council of Planning Librarians, P.O. Box 229, Monticello, Ill. 61856, $2.00.

Descriptors: Sources, Methodology, Management methods, Local government, Information systems, Health related organizations, Health planning agencies, Health care, Documents, Consumers, Community relations, Availability.

Literature relating to citizen involvement in the planning process is presented in one of a series of bibliographies developed by the Council of Planning Librarians. The bibliography draws upon research and theoretical perspectives not only from planning literature, but also from

economics, political science, psychology, public administration, and sociology. References include materials which offer general and theoretical perspectives that may be useful in developing frameworks to help guide research. Other listings cite empiricial research and case studies in the U.S. and in other countries. Most materials listed were published between 1961 and 1973.

HRP-0006224/0GA Not available NTIS
Medicaid: The Patchwork Crazy Quilt.
1969, 29p
Pub. in Columbia Jnl. of Law and Social Problems v5 p62-90 1969.

Descriptors: United States, New York, Legislation, Law(Jurisprudence), Health resources, Health care facilities, Health care delivery, Health care delivery systems, Financing.

Four years of experience under Medicaid since its inception in 1965 are examined, with a view toward demonstrating the immediate and pressing need for a basic restructuring of the Medicaid program as it existed in 1969. Section I describes the legislative history of the program, Federal matching funds, and requirements for State participation under the Title XIX. Section II examines Federal - State interaction under the provisions of Title XIX, including Federal expenditures in the first two years of Medicaid and the extent of participating State plans. Section III presents a detailed study of the New York State Medicaid program, including descriptions of persons covered, services provided, State expenditures, and difficulties experienced. New York State and City encountered major problems in registering eligible persons, participation by physicians, establishing an equitable system of payment to physicians and hospitals, and making prompt payments to medical vendors. It is concluded that, on the Federal level, the Title XIX program (as it had developed as of 1969) fosters numerous inequities among States and individuals. Although the stated goal of initial Medicaid legislation was a reduction in these inequities, 1967 Federal reductions in Medicaid coverage seriously limited the scope of Medicaid programs. It is suggested that the original structure of the Medicaid plan had been abandoned and that attention to a restructuring of the program was urgently needed.

HRP-0006232/3GA Not available NTIS
McCray Memorial Hospital, Kendallville, Ind.
Hospital-Based EMS Program Serves Rural County.
Dennis A. Wolford. 1975, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v49 n21 p51-52, 54, 56 Nov 75.

Descriptors: Strategy, State regions, *Rural health services, Rural areas, Plans, Methodology, Indiana, Implementation, Health planning, Health care services, Health care delivery, *Emergency medical services, Development, Data acquisition.

The planning and implementation of a hospital-based emergency medical service (EMS) in Noble County, Indiana is described. Design of the service followed the announcement by the county funeral directors that they would no longer provide ambulance service and non-emergency transportation service after January 1, 1974. Public meetings held with the county commissioners led to the appointment of the local hospital's administrator and a local funeral director to draft a plan. The plan was approved by the State Board of Health and was funded by the Councy Council. The hospital operates the EMS program, which has six ambulances, two at the hospital and four located strategically in the county, and one invalid coach. The hospital is part of the State Hospital Emergency Radio Network, and has arranged for countywide use of the WATS line by citizens needing an ambulance. A 24-hour dispatcher is maintained at the hospital, and, when a call is received, he dispatches the ambulance nearest to the emergency. Each ambulance is equipped with a four - channel, two-way radio, which can communicate with the hospital, police and fire departments and police cars. A staff of emergency medical technicians was set up, and other employees were encouraged to take the training course when possible. The major advantage of a hospital-based EMS program is that the hospital's medical record-keeping system and patient accounting system can be utilized by the EMS at minimal cost.

HRP-0006236/4GA Not available NTIS
American Group Practice Association, Alexandria, Va.
Sources of Funds for Health Care Organizations.
Alexandra W. Cook. 1975, 179p
Available from the Library of the American Group Practice Association, P.O. Box 949, Alexandria, Va. 22313, $30.00.

Descriptors: United States, Private facilities, Prepaid health care, Health resources, Health insurance, Health care facilities, Health care delivery, Financing.

Proceedings are presented of a symposium sponsored jointly by the American Group Practice Association and the American Academy of Medical Directors to explore methods of locating necessary financial resources to meet the growing demand for health services. Areas of discussion focused on sources of capital in today's money market, establishing a research and educational foundation, and exploring the various aspects of the Federal procurement process. An overview of facility financing was presented, followed by two related presentations, one concentrating on private sector capital, and one on government programs. An overview of the current Federal health scene was provided, with an outline distributed to participants of current constraints and economic, legislative, and organizational activities. Other speakers addressed such specific Federal programs as Health Maintenance Organizations, Migrant Health, Maternal and Child Health, Family Planning, National Health Service Corps, Emergency Medical Services System Act, and various National Institutes of Health programs. The role of philanthropic foundations in today's health care scene was also discussed, as was comprehensive health care planning. Participants are listed, and appendices present supplementary data.

HRP-0006251/3GA PC$4.00/MF$3.00
Region XI Comprehensive Health Planning Council, Inc., Columbus, Ind. Long Term Care Facilities Task Force.
Region XI Long Term Care Facilities Plan.
Sep 73, 38p

Descriptors: State regions, State government, Reviewing, Plans, Patients, Methodology, *Long term care, Local government, Inpatients, Indiana, Health care, Health care utilization, Health care requirements, *Health care facilities, *Health care delivery, Evaluation, Certification, Assessments.

A long-term care facilities plan is presented for the five counties served by the Region XI Comprehensive Health Plannin Council, Inc. of Indiana. The plan consists of two parts: an 83 percent cutoff formula which uses occupancy rates as its basis; and a set of policy statements designed to create wider understanding and usage of the plan. The plan formula allows the planning agency to approve the number of beds which would bring each county's occupancy rate to 83 percent, the occupancy level at which the average facility can return a reasonable profit. Under the plan, the agency will undertake a quarterly review of patient days in each county to determine any significant changes in nursing home utilization. Appendices include a glossary of selected terms, patient and waiting list origin maps, summaries of public hearings, utilization data, bed inventory as of June 30, 1973, age distributions for each county, and population projections. Portions of this document are not fully legible.

HRP-0006304/0GA /Not available NTIS
Drug Abuse Council, Washington, D.c.
Alcohol and Druge at Work.
Sibyl Cline. Oct 75, 60p
This was prepared for the 103rd Annual Meeting of the American Public Health Association, November 16-20, 1975, Chicago, Illinois.
Available from the Drug Abuse Council, Inc., 1828 L St. N.W., Washington, D.C. 20036, $1.25.

Descriptors: United States, Strategy, Public health, Project planning, Plans, Methodology, Mental health care, *Health planning, Health education, Health care delivery.

The problem of drug and alcohol abuse in the United States labor force is reviewed, and employer-implemented or labor union-implemented programs to deal with the employee with alcohol or drug problems are discussed. Statistics show that the most common cause of job difficulties is the excessive use of alcohol or other drugs. At the time of writing only 531 of the 1.5 million private corporations in the United States have alcohol treatment programs, and far fewer have drug abuse programs. The costs of problem drinking and drug abuse to the individual worker, to industry, and to society are examined, and patterns of job-based risk factors in problem drinking and drug abuse are identified. Following the observation that the work place may represent the final point of possible intervention in an individual's drug or alcohol problem before more severe stages of social dysfunction set in, guidelines for establishing constructive programs within industry are presented. Such programs should do the following: (1) create an awareness of the problem; (2) educate both labor and management on the scope and nature of the problem; (3) establish formal steps for dealing with those who need help; (4) provide a linkage for referral, treatment, and rehabilitation; and (5) follow-up on each individual involved in the program. Three examples of existing policies and programs are described: the policy for treatment of problem drinkers of the International Association of Machinists and Aerospace Workers; the alcohol abuse and drug abuse rehabilitation programs of the Illinois Bell Telephone Company; and INSIGHT, a model 'troubled employee' program developed for the Kennecott Copper Corporation in Utah. A selected bibliography, list of Drug Abuse Council publications, and supporting tabular data are included.

HRP-0006309/9GA Not available NTIS
American Group Practice Association, Alexandria, Va.
Comprehensive Quality Assurance System. The Kaiser - Permanente Approach.
Leonard Rubin. 1975, 123p
Available from the American Group Practice Association, P.O. Box 949, Alexandria, Va. 22313, $30.00.

Descriptors: State regions, Standards, Reviewing, Quality assurance, Peer groups, Methodology, Measurement, *Health care, Health care delivery, Evaluation, Criteria, California, Assessments.

A system for improving the quality of medical care services is described as it evolved over a five-year period at the Kaiser - Permanente Medical Care Program in northern California.

The comprehensive quality assurance system (CQAS) operates in 11 hospitals and in all clinics of the Program. The system is applicable to medical care regardless of setting (hospital or ambulatory) or provider (physician, nurse, or allied health personnel). CQAS addresses problems encountered in the interfaces between these various providers and settings. The system is adaptable to modification and is suitable for application to all appropriate health personnel from direct patient care provider to administrative executive. Ongoing evaluation is provided by means of a complete feedback loop. CQAS does not depend on specific organizational structure, medical record format, coding scheme, abstracts of records, or computer assistance. Application of the system at the medical center and departmental levels is outlined. The problem identification component is described. The system's adaptability to locally determined standards and local peer review are noted. Use of CQAS worksheets is explained, and sample completed worksheets are appended.

HRP-0006457/6GA Not available NTIS
Concept of Need for Health Services.
Kenneth E. Boulding. 1966, 22p
Pub. in the Milbank Memorial Fund Quarterly v44 n4 p202-223 Oct 66.

Descriptors: Sociology, *Health economics, Health care, Economics, Economic theory.

A theoretical discussion is presented of the concept of need for health services and the utility of that concept in economic research. It is first pointed out that the need concept often is criticized, as denying the autonomy and individuality of the human person, unlike the concept of demand, which implies free choice and a tailoring of inputs to individual preferences. Certain weaknesses inherent in the demand concept are described; the concept of need which emerges from the criticism of demand is that of professional choice: one's demand for medical care is what he wants; one's need for medical care is what the physician thinks he ought to have. The idea of professional need rests on some definition of homeostasis or state maintenance of the client, his property, or his environment. The concept of professional need is thus broken down into two problems: the problem of homestatic need, and the problem of perception or knowledge of homeostatic need. The necessity for thinking in terms of the homeostasis of the whole society rather than merely of the individual is observed. Medical science, it is noted, has considered health mainly in terms of inputs to an individual, not to a society. The possibility of an acute conflict between the health of the individual and that of society has received 'scandalously little attention.' Qualitative population control as it might conceivably affect medical care in the future is considered, as is the degree to which health is a matter of social definition. It is observed that, in addition to the idea of homeostatic or professional need, the concept of need also embodies what an individual cannot afford to have, i.e., need as an equalitarian concept -- 'from each according to his ability, to each according to his need' -- as opposed to demand as a libertarian concept. Problems of a grants economy and implications of the above considerations for future research are discussed in closing. A bibliography and critique of the monograph are included.

HRP-0006484/0GA Not available NTIS
How the Doctor Shortage Hurts While it Lasts.
Jay W. Gossett. 1971, 9p
Pub. in Medical Economics Oct 71.

Descriptors: Statistical distributions, State regions, *Physicians, Michigan, Medical services, *Health resources, Health occupations, Health manpower, Health care, Health care requirements, Distribution, Demography, Communities.

The impact of the physician shortage in Lansing, Michigan is assessed. Patients in Lansing are experiencing difficulty in finding physicians. Private practitioners in the same community are depending more and more on hospital emergency rooms and outpatient clinics to bridge the gap between supply and demand, with inevitable increases in costs to patients. Some Lansing physicians are initiating corrective action, but their efforts are not sufficient in the area of increasing physician productivity. There appears to be little likelihood that enough new physicians in key specialties will open practices in Lansing. Comments by physicians on the shortage of medical service in Lansing are presented, along with comments of patients who have attempted to obtain service in that community. Statistics on the utilization of emergency room facilities are presented. It is concluded that, if Lansing can cope with its short-range health care gaps through an immediate increase in productivity and then attract adequate numbers of new physicians, the community can end its own physician shortage. Greater efficiency and increased productivity are emphasized as solutions to the shortage of medical services.

HRP-0006489/9GA Not available NTIS
Ball Memorial Hospital, Muncie, Ind.
Secret of Caring for More Patients.
Ross L. Egger. 1971, 5p
Pub. in Medical Economics 2 Aug 71.

Descriptors: Preventive medicine, Physicians, *Patients, Health manpower, Health education, Health care utilization, Health care services, Education, Consumers.

A method of patient care is described in which patients are encouraged to manage their own small illnesses. It is felt that the physician shortage in the United States could be minimized or eliminated if each of the more than 50,000 general practitioners and family practitioners involved in patient care would handle a load of 4,000 patients. Virtually all primary care problems would disappear with a 4000 - patient load, and specialists could concentrate on treating the seriously ill. It is recommended that physicians enlist their patients as assistants and take time to train them to help themselves and their families. In this manner, the daily patient load can be reduced even though a physician still may have 4000 patients on his roll. Specific illnesses are noted in which patient involvement in treatment is feasible. It is recommended that nurses be trained to assess patients' reliability in evaluating their own condition or the condition of family members. It is also recommended that time be spent during the patient's annual physical to discuss what the patient can do in managing his own medical problems.

HRP-0006729/8GA Not available NTIS
Chicago State Coll., Ill.
Health Manpower in the 1960s.
Jon D. Miller, and Bernard Ferber. 1970, 6p
Pub. in Hospitals v45 n4 p66-71 16 Feb 71.

Descriptors: United States, Supplies, Reserves, Physicians, Nurses, Methodology, Medical personnel, Measurement, Inventories, *Health resources, Health occupations, *Health manpower, Health care, Health care requirements, Allied health personnel.

Manpower issues as of 1971 are discussed in the context of the changing state of medical science, and the adequacy of manpower supplies for hospitals is assessed. Increasing awareness of health manpower problems is illustrated by the scope of reports and types of solutions envisioned in major national studies of the 1960's, e.g., the report of the Surgeon General's Consultant Group in Medical Education (the Bane Committee) in 1960; the report of the Surgeon General's Consultant Group on Nursing (the Eurich Committee) in 1963; the President's Commission on Heart Disease, Cancer, and Stroke (the DeBakey Commission); and others. These studies reflect a fundamental revision of the nature of health manpower concern during the 1960's. By the end of the decade, it was generally agreed that needs had outrun production of physician manpower, but the emphasis appeared to shift from numbers to productivity. An overview of hospital employment shows that the total number of hospital employees grew steadily during the 1960's, increasing from 1.5 million at the start of the decade to about 2.3 million in 1968. A further examination of supply and demand for personnel in various occupational classifications provides a fuller understanding of manpower trends. Data are presented which suggest that the shortage of health manpower has been significantly reduced in recent years, with the greatest shortages remaining in the areas of therapeutic services. There is indication that the crises in nursing and allied manpower have abated. It is suggested that the task of the 70's may be to find workable solutions to the basic problems of delivery that were excluded from the 1960's focus on production and utilization of health manpower. A bibliography is included.

HRP-0006734/8GA Not available NTIS
Louisville Univ., Ky. Dept. of Community Dentistry.
Attitudes and Background Values as Predictors of Urban-Rural Practice Location.
James D. Beck, and Edward B. Gernert. 1971, 9p
Contract PH-108-69-20
Pub. in Jnl. of Dental Education p45-53 Sep 71.

Descriptors: Statistical distributions, Rural health services, Rural areas, Kentucky, *Health resources, Health occupations, Health manpower, Health care, Health care services, Distribution, *Dentists, Demography, Communities.

Results are presented of a study that was conducted to determine which factors in a dentist's background and attitudes influence his choice of practice location. A scale designed to measure attitudes toward urban and rural dental practice was developed, along with a questionnaire to ascertain cues toward and barriers to practice location. Participants included a sample of 400 dentists in Kentucky equally divided between urban and rural practices, and a sample of 277 dental students from the Universities of Louisville and Kentucky. The dentists' own ranking of the importance of various influences on their choice of practice location, in order, include: encouragement of friends, availability of a good practice location, and feeling that the community would provide for the needs of his family. Of least importance were community need for another dentist, adequate schools, and expressed opinion of the dentist's family. The biggest advantages claimed for a small community were closer relationships and the ability to establish practice more rapidly; disadvantages cited were lack of privacy, lack of cultural advantages, and smaller income. Large community advantages were cultural, larger income, and better facilities. Dental students indicated the main influence on practice location as linking the area as a place to live. Least important influences to students were encouragement of friends and opinions of their families.

HRP-0006736/3GA Not available NTIS
Hospital Survey Committee, Philadelphia, Pa.
Health Facility Planning Guide: Utilization of Facilities for Diagnostic Radiology.
Feb 75, 16p

Available from the Hospital Survey Committee, 7 Benjamin Franklin Parkway, Philadelphia, Pa. 19103, $1.00.

Descriptors: Regions(United States), Pennsylvania, Patients, New Jersey, Methodology, Measurement, Inpatients, Health care, *Health care utilization, Health care facilities, Acute care.

Guidelines are presented for determining appropriate levels of utilization for diagnostic radiologic facilities within hospitals. The document represents a reevaluation of the previously established guideline that examination rooms in departments of diagnostic radiology should be utilized at a rate of 20 examinations per room per day. Guidelines are based on a survey of 28 acute care hospitals in the Philadelphia - South Jersey metropolitan area; usable data were provided by 24 hospitals, accounting for 39 percent of all diagnostic radiologic examinations performed in acute care hospitals in the area during the 12-month period studied (June 1972-June 1973). Data are presented and analyzed indicative of demand for radiologic examination services, and of the scope and complexity of services delivered. In addition, area radiologic examination facilities are categorized by diagnostic capability (general, fluoroscopic, special procedure, or other special) and by department size for the sample hospitals. The variation by size of department in the proportion of examinations by examination subgroup such as basic and survey chest and other common examinations; total common radiographic and fluoroscopic examinations; other general radiographic and fluoroscopic examinations; mammography, themography, and ultrasound; and special procedures provided the basis for derivation of multi-level utilization guidelines for small (1 to 5 rooms), medium (six to 12 rooms), and large (13 or more rooms) departments. The following number of examinations per room per year are recommended: 6,450 in small departments, 5,750 in medium departments, and 5,250 in large departments. Survey findings and development of the recommended utilization guidelines are described in detail. Tabular data and computations are included.

HRP-0006834/6GA PC$8.00/MF$3.00
Seven County Health Planning Council, Wooster, Ohio.
Areawide Health Plan.
Feb 75, 243p

Descriptors: Systems, State regions, State government, Plans, Ohio, Methodology, Local government, *Health planning, Health care delivery, Health care delivery systems, Development, Data acquisition.

An areawide health plan is described that is intended to provide a flexible framework for the improvement of health care in Ashland, Carroll, Homes, Richland, Stark, Tuscarawas, and Wayne Counties, Ohio. Six major sections of the plan focus on the status and future development of acute inpatient services, long-term care, home health services, ambulatory health services, emergency medical services, and environmental health services. Each section of the plan includes a discussion on general issues, problems, and concerns, as well as an evaluation of existing resources for providing services. Recommendations, criteria, and guidelines are included in each section of the plan which will be used by the Seven-County Health Planning Council in its consideration of health facilities and service projects which come under its review responsibilities. Consumers, health professionals, and representatives of local government participated in the plan's development to ensure its relevance and acceptability throughout the seven-county area. It is noted that the plan is designed to be flexible and subject to continuing review and revision in order to meet changing health care needs.

HRP-0006835/3GA Not available NTIS
Institute of Medicine, Washington, D.C.
Controls on Health Care.
1975, 182p
Contract DHEW-OS-74-95
This volume contains the principal papers presented at the Conference on Regulation in the Health Industry, January 7-9, 1974, Washington, D.C.
Available the National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418, $5.25.

Descriptors: Regulations, Physicians, Health occupations, Health care delivery systems.

Papers presented at the Conference on Regulation in the Health Industry, held in Washington, D.C. in January 1974 are provided. The Conference was sponsored by the Institute of Medicine, National Academy of Sciences, and was organized in response to the increasing interest nationwide in proposals to expand governmental regulation of the health industry. Scholars and experts were invited to prepare papers for the Conference on a variety of topics related to existing and proposed regulatory mechanisms in the health field, as well as on developments in other regulated industries. Participants included about 150 high-level staff members of the executive and legislative branches of the Federal Government, individuals engaged in regulatory activities at Federal and State levels, individuals whose experience enabled them to reflect the interests and experience of health care providers and of third-party payers, and others who were expert in the area of regulation. The following topics were addressed at the Conference: introduction to regulation, regulation of supply in health care, consequences of public utility regulation of hospitals, regulation of payment to institutions, and regulation of payment to physicians.

HRP-0006891/6GA Not available NTIS
Indiana Univ. Medical Center, Indianapolis.
Study Documents Effect of Primary Nursing on Renal Transplant Patients.
Katherine Jones. 1975, 4p
Pub. in Nursing v49 p85-86, 88-89 16 Dec 75.

Descriptors: State regions, Specialists, Registered nurses, Nurses, Michigan, Health manpower, *Health care utilization.

The effect of primary nursing on the postoperative adaptation of renal transplant patients is evaluated in a study at the University of Michigan Medical Center. Participants in the study were the nursing staffs of two hospital units involved in the care of kidney transplant patients and all patients over the age of 13 admitted to those hospital units. Patients were assigned to either a routine nursing care control group or an experimental group in which a primary nurse assumed responsibility for the care of the subject throughout his hospitalization. Each subject in both groups was observed, and patients completed questionnaires concerning their perceptions of the nursing care. The control group exhibited an average of 117.6 negative behaviors over the three - week observation period, while the experimental group exhibited 72.4 negative behaviors. The control group was hospitalized for a mean of 48.6 days; the experimental group for a mean of 26.8 days. A mean of 4.6 complications was experienced by the control group and 1.4 complications by the experimental group. The results indicate that patients respond to major surgery more quickly and with fewer adaptive problems if one primary nurse is responsible for their care care throughout their hospitalization.

HRP-0006934/4GA Not available NTIS
Wisconsin Univ.-Madison.
Interdisciplinary Teamwork in Family Health Care Implications for Clinical Service and Professional Education.
Carolyn R. Aradine, and Marc F. Hansen. 1970, 11p
Pub. in Nursing Clinics of North America v5 n2 p211-222 Jun 70.

Descriptors: Wisconsin, State regions, Preventive medicine, Plans, Physicians, Patients, Organization theory, Nurses, Health resources, Health related organizations, Health occupations, Health manpower, Health manpower education, Health education, Health care services, Family planning, Education, Consumers.

The University of Wisconsin Family Health Service (UFHS) is described as an interdisciplinary and interdepartmental education program to explore the delivery of health services within the primary (community) sector of the health services system. The UFHS provides complete pediatric, obstetric, nursing, and family counseling services for a population of more than 1,000 families and education programs for physicians, nurses, and social workers. The team approach to providing pediatric services is emphasized, and it is noted that the UFHS health team is composed of a physician, nurse, and family counselor (social worker). The team is characterized by equivalent status and complementary skills. Each member has unique skills and independent responsibilities; the composition of the team involved with any given family is flexible, varying in accord with needs and problems of that family. Additional disciplines are added to the team as needed in each situation. Leadership within the UFHS health team is also flexible; the physician is not necessarily the sole leader, director, or decision-maker, and a family has access to any team member without going through a coordinator. The UFHS team focuses on promoting total health and the enhancement of parent skills and understanding in the care of their children. Educational efforts are based on the assumption that education should be provided in a realistic clinical setting where effective teamwork is practiced by faculty, staff, and students.

HRP-0006952/6GA Not available NTIS
Youville Rehabilitation and Chronic Disease Hospital, Cambridge, Mass.
Home Evaluation: An Extension of Comprehensive Restorative Care.
Charles D. Bonner, and Yun Hwa Yu. 1972, 8p
Pub. in Geriatrics p59-66 Dec 72.

Descriptors: State regions, Reviewing, Research, Rehabilitation, Projects, Preventive medicine, Patients, Methodology, Massachusetts, Health education, Health care, Health care services, *Health care delivery, Feasibility studies, Evaluation, Education, Consumers, Comments, Assessments.

The concept of home evaluations as an extension of comprehensive restorative services is examined. A pilot study of a home evaluation program was conducted in 1963 and 1964, supported by a grant from the Massachusetts Department of Health. The results were so encouraging that the program was incorporated into the routine restorative program at the Youville Rehabilitation and Chronic Disease Hospital in Cambridge, Massachusetts. The home evaluation program is designed to give study team members the opportunity to assess modification and equipment needed in the home environment so that a patient may return there and maintain or improve upon gains made in rehabilitation. The concept of home evaluation as an extension of comprehensive restorative services is judged successful. The procedure provides an opportunity for suggestions concerning the safety and better management of patients to be made. In the course of the study, those who accepted and

followed such suggestions did well in maintaining their functional gains. Probably the greatest asset associated with home evaluation is the significant degree of communication among all parties concerned in the restorative process. This exchange enhances the goal of providing better and continuing patient care.

HRP-0007017/7GA Not available NTIS
Kentucky Univ., Lexington. Coll. of Nursing.
Nursing in the South.
Hessel H. Flitter. Jan 68, 57p
Available from the Southern Regional Education Board, 130 Sixth Street N.W., Atlanta, Ga. 30313, single copy free.

Descriptors: Supplies, Reserves, Registered nurses, Regions(United States), *Nurses, Methodology, Medical personnel, Licensed practical nurses, Inventories, Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Health care, Health care requirements, Forecasting.

The supply of nurses in the South in 1967 and their employment are described and the estimated future supply of nurses in this region is compared with national goals in this study by the Southern Regional Education Board. No original data were collected, but data were obtained from various agencies and organizations. In 1966, an average of 319 nurses per 100,000 population were employed outside the South, while in the South, only 198 nurses were employed per 100,000 population. The Division of Nursing of the Public Health Service, DHEW has set a goal of 450 registered nurses RNs per 100,000 population by 1975. Tables detail the supply of nurses and projections based on a constant number of nursing graduates and a slight increase in the number of graduates. The various fields in which RNs and licensed practical nurses are employed are illustrated graphically for both the South and the entire country. The status of nursing education -- schools, students, and faculty -- is assessed for diploma, baccalaureate, and associate nurse training programs and for masters programs. Appendices contain annotated references, notes, and a description of the Southern Regional Education Board Nursing Education Project.

HRP-0007031/8GA PC$4.00/MF$3.00
Health Planning Association of the Central Ohio River Valley, Cincinnati.
Report of the CORVA Drake Hospital Committee.
Nov 75, 45p

Descriptors: State regions, Research, Patients, Ohio, Nursing, Long term care, Inpatients, Health resources, *Health care facilities, *Health care delivery.

The report of the Central Ohio River Valley (CORVA) Drake Hospital Committee concerning the future role of that facility in the health care delivery system of Hamilton County, Ohio, is presented. In analyzing Drake's community role within the framework of the institution's stated purposes and objectives, the committee identified a number of problem areas. Present and potential problems were analyzed under the following headings: type of patient, scope of services, management problems, policy problems, medical staffing, physical and locational problems, financial problems, duplication of existing health services, and public image. It was concluded that the Drake facility should serve as a special nursing care facility to provide services for those who require a level of skilled care above that provided in a general nursing care facility, but not as comprehensive as that provided in a hospital. It is noted that, as a special nursing care facility, Drake would have a definitive role in health care delivery, would provide a level of care vital to the community, and would promote continuity of care within the community's health delivery system. Recommendations conducive to implementation of this newly defined role are presented. Supporting materials, including a list of studies and reports utilized by the committee and a questionnaire used in interviews with staff of hospitals that refer patients to Drake, are appended.

HRP-0007162/1GA Not available NTIS
Alabama Univ. in Birmingham. Dept. of Oral Medicine.
Familial Clinical Patterns: I. Reported Symptoms and Signs in the Dentist and His Wife.
E. Cheraskin, and W. M. Ringsdorf. Feb 70, 4p
Pub. in Geriatrics v25 n2 p123-126 Feb 70.

Descriptors: Ohio, Occupational safety and health, Florida, Environmental health, *Dentists, California.

A study is reported of 115 dental practitioners, their wives, and 115 unrelated women to determine the relationship between reported medical symptoms in married couples and the husband - wife correlation with the unrelated female group. The dental practitioners, their wives, and the unrelated women who were age - paired with the wives, participated in a multiphasic screening program in California, Ohio, and Florida. In addition, each subject completed a self-administered form consisting of 195 questions. The frequency of medical symptoms and signs appeared similar in married couples, but there was no significant relationship between symptom - sign frequencies in unrelated men and women. The correlation between married couples was less significant in the group aged 30 to 40 than in those over 41. The age factor was not significant at all between the husband and the unrelated women in either age group. Evidence suggests that, as couples live together longer, their complaint frequencies become more alike.

HRP-0007164/7GA Not available NTIS
Federal Communications Commission: Medical Communications Services.
1974, 11p
Pub. in Federal Register v39 n137 Part III p26116-26126 16 Jul 74.

Descriptors: Regulations, Health care services, Health care delivery systems, *Emergency medical services.

Changes to the Federal Communications Commission Rules and Regulations establishing a medical services category in the Special Emergency Radio Service, documented in the Federal Register of July 16, 1974, are presented as an adjunct to the Department of Health, Education and Welfare guidelines on emergency medical services (EMS) communications systems. The new rules category expands eligibility to include, in addition to hospitals, physicians, and ambulance operators, facilities such as public health organizations, nursing homes, and other institutions which regularly provide medical services. Additional frequencies are allocated for medical services operations, with emphasis placed upon flexibility in permissible communications. The text of the amended regulation concerning the Special Emergency Radio Service is included.

HRP-0007165/4GA PC$3.50/MF$3.00
Bureau of Medical Services, Hyattsville, Md. Div. of Emergency Medical Services.
Special Emergency Radio Service. Subpart P of Rules and Regulations Governing Emergency Medical Services Radio Communications of the Federal Communications Commission.
1974, 24p
See also related documents, HRP-0006521 and HRP-0007164.

Descriptors: Regulations, Health care services, Health care delivery systems, *Emergency medical services.

Subpart P of the Federal Communications Commission Rules and Regulations Governing Emergency Medical Services (EMS) Radio Communications is presented to be used in conjunction with the DHEW guidelines for planning EMS communications systems. Subpart P is concerned with the Special Emergency Radio Service, and sets forth eligibility requirements, classes of stations available to each eligible group, permissible communications in accordance with eligibility, and other applicable conditions of use pertaining to Special Emergency Radio Service. Classes of eligibility include medical services, rescue organizations, veterinarians, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communication standby facilities, and emergency repair of public communications facilities. Frequencies available for assignment to stations in the Special Emergency Radio Service are designated, and station limitations are noted. Applicable definitions are provided.

HRP-0007192/8GA Not available NTIS
Connecticut Univ. Health Center, Farmington.
Help Patterns in Severe Illness: The Roles of Kin Network, Non-Family Resources, and Institutions.
Sydney H. Croog, Alberta Lipson, and Sol Levine. 1971, 10p
Grant PHS-HS-00268
Pub. in Jnl. of Marriage and the Family v34 n1 p32-41 Feb 72.

Descriptors: Statistical distributions, State regions, Sociology, Socioeconomic status, Socioeconomic factors, Research, Massachusetts, *Health resources, Health care, Health care delivery, Demography, Communities.

The results of a study are reported which concern differential perception of help patterns and the use of kin, non-kin, and institutional resources by men during a time of recuperation from an illness crisis. The study population was obtained from 26 hospitals in the Greater Boston and Worcester, Massachusetts areas and consisted of previously well males who experienced their first myocardial infarction. The patients were interviewed in a three-stage series. The first interview, a brief introductory one, took place while the patient was still in the hospital. The second interview was carried out one month after discharge, and the third was completed one year after the occurrence of myocardial infarction. A total of 293 patients formed the study group and ranged in age from 30 to 59 years. Members of the kin group as well as friends and neighbors ranked similarly in the degree of assistance reported by study participants. Minimal use was made of institutional and professional services, aside from physician contact. The type of assistance that was given varied according to source; non-kin such as neighbors provided services in higher proportion than kin, while parents and siblings were more prominent as sources of financial aid. Among the possible correlates of aid examined, only age of the patient was associated with types of help from various sources.

HRP-0007198/5GA PC$4.00/MF$3.00
Capitol Area Wide Comprehensive Health Planning Association, East Lansing, Mich.
Comprehensive Health Plan for the Counties of Clinton, Eaton, and Ingham. Acute Care Facilities: Obstetric Care.
1975, 27p
Grant PHS-05-P-0000-22-05-0

Descriptors: State regions, State government, Prenatal care, Pregnancy, Plans, Michigan,

Local government, Health care facilities, *Health care delivery, Children, Child health services.

A five-year obstetric care plan for three Michigan counties (Clinton, Eaton, and Ingham) is presented by the Capitol Area Wide Comprehensive Health Planning Association. The plan is designed for a projected 5,760 deliveries in the year 1980, with an average postpartum stay of four days, and an average 75 percent occupancy rate for postpartum beds in the area. The plan provides for hospital-based obstetric units in each of the three counties, with three levels of care offered at different hospitals. Level - one hospitals will provide services primarily for uncomplicated maternity and newborn patients; level - two hospitals will provide prenatal and neonatal services for more complex obstetric and newborn patient problems; and level - three facilities will provide care for normal patients as well as provide or arrange for care of all types of maternal - fetal and neonatal illnesses and abnormalities. It is suggested that one hospital, already equipped to provide level - three services, also assume responsibility for perinatal education programs in the region. Other recommendations concern number of beds, quality of care, accessibility and acceptability, and cost containment. Several specific suggestions are made for the level - three facility. A glossary and bibliography are provided.

HRP-0007219/9GA Not available NTIS
How Organizations Can Learn to Live with Change.
1974, 5p
Pub. in Modern Health Care v3 n1 p39-43 Jan 75.

Descriptors: Strategy, Methodology, *Health planning.

A method is described for making change-resistant organizations, particularly health care institutions, more flexible and amenable to change. A three-part strategy is suggested to make hospitals more adaptable: (1) view change as innovative rather than threatening, with the goal of producing some visible improvement and learning in an institution within a few weeks or months; (2) create and learn to use new tools to manage a growing program of change, such as the written project agreement and the written work plan; and (3) develop comprehensive planning to give direction to the overall process of change. It is noted that planning introduces integrity into what otherwise might be divergent or even conflicting efforts. It is further noted that planning can create and win commitment to overall goals which can inspire and motivate people throughout an organization. Examples are cited of changes that have occurred in both small and large institutions using the techniques outlined for effecting new procedures.

HRP-0007220/7GA Not available NTIS
Peer Review Now: PSRO at Work.
Larry D. Frederick. 1974, 7p
Pub. in Modern Health Care v3 n1 p49-55 Jan 75.

Descriptors: Reviewing, Registered nurses, Regions(United States), Quality assurance, *PSRO(Professional Standards Review Organizations), *Professional standards review organizations, Physicians, Peer groups, Nurses, New Mexico, Methodology, Measurement, Management methods, Health resources, Health related organizations, Health planning agencies, Health occupations, Health manpower, Health care, Coordination, Cooperation, California.

The performance of two prototype professional standards review organizations (PSROs), one in the Sacramento, California area and the other in New Mexico, is reviewed. The hospital review programs are run by a foundation for medical care (FMC) of which PSROs will be offshoots. Initially, the Sacramento program faced stiff opposition from local physicians but was later voted in. Organized to decrease hospital length of stay (LOS) and thus decrease costs, PSROs are made up of physician - advisors and nurse coordinators who review elective admissions and LOS requested extensions. Nurse coordinators are also specially trained to work with physicians on cases where there is doubt about the necessity for an extension. This decision is made by physicians, although an appeals process is available. Standards by which each organization judges LOS are different. In Sacramento, a local guidebook is used to show average LOS in terms of diagnosis and patient age. New Mexico uses regional professional activity study for its LOS determinations. The New Mexico PSRO turns review over to hospitals, but it monitors hospital performance. It is felt that costs have been reduced by PSROs, as evidenced by a reduction in the number of patients admitted to skilled nursing home facilities under the Medicaid program.

HRP-0007237/1GA Not available NTIS
British Columbia Univ., Vancouver. Faculty of Medicine.
Health Team Approach to Medical Education.
John F. McCreary. 1968, 4p
This paper was presented to the 64th annual Congress on Medical Education, sponsored by the AMA Council on Medical Education, Feb. 11, 1968 in Chicago.
Pub. in the Jnl. of the American Medical Association v206 n7 p1554-1557 11 Nov 68.

Descriptors: Universities, Schools, *Medical education, Health resources, Health related organizations, Health occupations, Health manpower, Health manpower education, Health education, Foreign countries, Curricula.

The development of interprofessional education programs based on anticipated curriculum needs of a proposed health science training center at the University of British Columbia is described. An interprofessional curriculum committee was established, comprising representatives of faculties, schools, and departments which would utilize the health sciences center. The committee undertook to identify a block of material which should be known by every member of the health sciences team and to which the total group could be exposed simultaneously, to define a method for providing some contact with preclinical departments for all undergraduate students in the health sciences, and to consider the possibility of introducing undergraduates in all health professions to clinical learning situations relatively early in the undergraduate curriculum. Under the guidance of a medical school graduate hired to design exercises which would involve increasing numbers of faculty members in interprofessional education, the curriculum committee developed a number of integrated programs. These programs involve joint home visits by nursing and first-year medical students, a survey course in pathology for third-year nursing and rehabilitation students recently expanded to include other groups, and inclusion of several medical students in an urban planning program of the School of Architecture. In addition, first-year students from each health sciences school join in a concentrated, six-week exposure to the history of health sciences. Through such exercises, many faculty members have been given exposure to interdisciplinary education.

HRP-0007263/7GA Not available NTIS
Kentucky Univ., Lexington.
Relative Stability of Drug Prices and Pharmacists' Fees.
Norman F. Billups, and L. Randolph McGee.
1970, 4p
Pub. in Jnl. of the American Pharmaceutical Association v11 n1 p22-25 Jan 71.

Descriptors: United States, Professional personnel, Patients, Medical services, Kentucky, Inpatients, Indexes(Ratios), Health statistics, Health occupations, Health manpower, Health care, Health care indexes, *Health care costs, Dentists, Dental services, Demography, Data, Communities.

Rates of change in medical care prices and fees from 1963 through 1969 are compared. Total medical care prices increased at a rate about twice that for other necessities over the study period. There were, however, considerable differences in the rates of price increases among various types of medical services. At one extreme, semiprivate hospital rooms increased in price by 87.6 percent from 1963 through 1969. At the other extreme, prices of drugs and prescription medication increased by only 0.5 percent over this same period, and prescription charges actually decreased by 4.7 percent. The composite index of physician fees rose by 35.8 percent, while Kentucky pharmacist fees increased by 10 percent during the same time period. Dentist fees, optometrist fees, and charges for routine laboratory tests increased by 29.5, 19.9, and 17.4 percent, respectively, between 1963 and 1969. The latter two increased at about the same rate as prices in general, as reflected in the composite consumer price index. It is concluded that wide variations in the rates of increase for medical care service charges and professional medical care fees are only manifestations of underlying economic and social forces. The pressure of these forces varies within the medical care industry.

HRP-0007278/5GA Not available NTIS
Washington Univ., Seattle.
Are Professionals Educable.
Kathryn E. Barnard. 1969, 4p
Pub. in Alabama Jnl. of Medical Sciences v6 n4 p388-391 1969.

Descriptors: Washington(State), State regions, Reviewing, Quality assurance, Peer groups, Nurses, Methodology, Measurement, Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Health care.

Implementation of the interdisciplinary approach to student education in health professions at the University of Washington Affiliated Centers in Mental Retardation is described in a discussion on types of learning environments that stimulate student interest. The experience of the Summer Work Experience and Training Program at the university's Center for Child Development and Mental Retardation, in which students from a variety of disciplines and levels of education participated in student team evaluation and follow-up activities, is recounted. This experience indicates that the establishment of effective team functioning derives not only from team composition or experience of individual team members but also from an environment that promotes collaborative decision-making, i.e., one in which students are expected to achieve consensus concerning diagnosis, treatment, etc. Particular attention is directed to functions of the nurse in situations such as those encountered at developmental centers. It is noted that the nurse must adapt her caring functions to young children and their families who do not fit the traditional sickness-care-needing model. The potential effects of developing educational technology on basic teaching functions are considered.

HRP-0007299/1GA PC$5.00
NY-Penn Health Management Corp., Binghamton.
Community Mental Health Service Profile.
Gare LeCompte, Thomas J. McCord, Robert F. Thayne, Alfred M. Volo, and Mark E. Lafer. Nov 75, 97p
Grant PHS-MH-23699

Descriptors: Research, Regions(United States), Pennsylvania, New York, *Mental health care, Health resources, Health occupations, Health care utilization, Health care services, Health care facilities, Health care delivery, Ambulatory health care.

A study of the 1971 admissions to three county outpatient mental health clinics in the region served by the NY-Penn Health Management Corporation is documented, and selected comparisons are made to State hospital admissions for the region. The study is part of a two-year mental health systems analysis project conducted in the bi-State (New York and Pennsylvania) area. The report includes a description of the socio-demographic characteristics of each of three counties included in the study and of the clinic populations; an analysis of patient origins for each of the three clinics; a description of referral sources and termination disposition data; a description of services offered; and diagnosis and treatment effectiveness data. Among the conclusions reached are: (1) the elderly and less educated appear to be underserved in the three county clinics; (2) physical accessibility to the clinics appears to be an important factor affecting delivery of services; (3) self-referrals, along with referrals by family and friends, represent the largest source of referrals for the three clinics, although substantial referrals are received from several contact points throughout the human services network; and (4) 58 percent of all admissions are rated as moderately to severely disturbed, indicating that many individuals delay seeking help at the clinics until the problem becomes intolerable. It is noted that the clinical case records, upon which the study was based, provide a 'detailed and flexible' data set for investigating delivery of outpatient mental health services. A bibliography and supporting data are included. Portions of this document are not fully legible.

HRP-0007300/7GA PC$5.50
NY-Penn Health Management Corp., Binghamton.
Role and Organization in the Mental Health Professions.
Alfred M. Volo, Gare LeCompte, Thomas J. McCord, and Robert F. Thayne. Jan 76, 120p
Grant PHS-MH-23699

Descriptors: Research, Regions(United States), Physicians, Pennsylvania, New York, *Mental health care, Health resources, Health occupations, Health manpower, Health care services, Health care delivery, Allied health personnel.

Findings are presented of an investigation in which interprofessional role relations among mental health professionals were assessed in relation to the organizational structures of the agencies in which they work, their attitudes toward community mental health, and their relationships in treating clients. Part of a two-year mental health systems analysis project undertaken by the NY-Penn Health Management Corporation, the study involved mental health professionals in the five-county, bi-State (New York and Pennsylvania) region served by that agency. Emphasis was placed on the implications of the professional role relations for continuity of care. The foci of the study were the four agencies that provide core inpatient and outpatient mental health services for the region. Following a description of study methodology and of the internal organization of each agency, findings of the study with regard to interprofessional communications, professional stereotypes, and professional role expectations, as they relate to agency structure, are presented and discussed. It was found, generally, that mental health professionals in the region are, regardless of community mental health attitudes, organized in a medical model with psychiatrists at the top of the hierarchy, as indicated by organizational structure, communications patterns, power, influence, and encroachment. Implications of the findings for the future success of health teams composed of psychiatrists, clinical psychologists, and psychiatric social workers are discussed. Supporting data and copies of the questionnaires used to obtain information from the health professionals are included. Portions of this document are not fully legible.

HRP-0007305/8GA PC$5.50/MF$3.00
Comprehensive Health Planning Council of Maricopa County, Phoenix, Ariz.
Study of Nursing Homes in Maricopa County.
21 Aug 75, 118p

Descriptors: State regions, Quality assurance, Patients, Methodology, Measurement, Long term care, Inpatients, Health resources, Health care, Health care facilities, Evaluation, Arizona.

Findings of a survey of nursing homes in Maricopa County, Arizona are presented by the Comprehensive Health Planning Council of Maricopa County. The study was undertaken to delineate the health, medical, and health-related needs of nursing home residents; to assess, by nursing home, which of those needs are met and to what degree; and to review the level of medical care provided. The relationship of financial resources to quality of care also was sought. The background and methodology of the study are described and observations are presented regarding each institution's program (range of activities and services offered), frequency of physician visits, governing authority, personnel, and residential and physical characteristics. Financial information is presented in tabular format by nursing home. Several recommendations are made relating to the formation of a committee on standards for local nursing homes and legislation mandating such a committee. Other recommendations concern: requirement of written and oral tests for prospective nursing home administrators to evaluate qualifications; introduction of special training courses and career incentives for nurses aides; expanded inspection responsibilities for the State Department of Health Service; and amendments of rate review legislation. Portions of this document are not fully legible.

HRP-0007307/2GA PC$6.00/MF$3.00
Rhode Island Health Services Research, Inc., Providence.
Rhode Island Long Term Care Information System.
1974, 131p
Grant PHS-HS-00964, Contract PHS-HRA-106-74-53

Descriptors: *Rhode Island, Projects, Methodology, Maintenance, Health care, Health care delivery, Development, Data processing, Data processing systems, Data bases.

Project activities undertaken relative to the design and implementation of a statewide long-term care information system in Rhode Island are documented. The project focused on the design and upgrading of statewide automated systems which could obtain selected, patient-oriented data items from all nursing homes, intermediate and chronic care hospitals, home health agencies, mental health facilities, and centers for the mentally retarded in Rhode Island. Activities involved in the development of the nursing home component are described, including: evaluation of alternative methods of data collection, design and implementation of a system of patient medical review, establishment of a facilites inventory file, and completion of a study to determine the feasibility of automating nursing home facility review in the State. The admission - discharge abstracting system established by the project in the State intermediate and chronic care hospitals is described, as are related project activities in the areas of mental health and retardation. Project participation in the evaluation and redesign of an existing home health agency data system are described, including a review of the data used in each agency, production of charts outlining office procedures and record flow, recommendations for system changes and innovations, programming assistance, educational workshops, and financial support of the redesign. A long-term care data workshop sponsored by the project to promote an exchange of ideas and technical expertise among various cooperative health statistics systems and other long-term care information sites is described. Problems encountered and insights gained in the course of the project are discussed, with emphasis on those findings that might provide guidelines for future attempts at data system development.

HRP-0007311/4GA PC$4.50/MF$3.00
Wyoming Univ., Laramie. Health Planning Resource Center.
Family Practice Residency Programs: A Benefit-Cost Approach to Resource Allocation Decisions.
Michael D. Joehnk, George R. McGrail, and Nicholas J. Degel. 1975, 53p
Contract PHS-298-74-0008

Descriptors: System analysis, Quality assurance, Methodology, Measurement, Mathematical models, Health care, Health care costs, Data processing, Data analysis, Cost effectiveness, *Benefit cost analysis.

A benefit-cost decision model is presented for use by hospitals in determining the advisability of establishing and operating an accredited family practice residency center under hospital auspices. The model divides data variables into three categories: (1) direct costs, (2) receipt flows, and (3) direct and indirect benefits. The third category contains both measurable receipt - type variables, as well as largely unquantifiable intangible community benefits. With these data identification and specification procedures, an operational version of a benefit-cost decision model is developed for use in site - specific situations to determine the desirability of sponsoring a proposed family practice center. Variations of this basic model are presented for evaluating the largely intangible benefits to the community at large. The model can be used in the basic decision of whether to allocate funds, and can be employed to determine the most desirable configuration for the center in question. Worksheets for preparing and analyzing receipts, costs, and quantifiable benefits related to establishment of a family practice center are appended, including final worksheets which consolidate data.

HRP-0007313/0GA Not available NTIS
Social Security Administration, Washington, D.C. Office of Research and Statistics.
Comparison of Cost and Benefit Incidence of Government Medical Care Programs, Fiscal Years 1966 and 1969.
Barbara S. Cooper, and Nancy L. Worthington. 1975, 95p DHEW/SSA-75/11852
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20042, $1.65.

Descriptors: United States, Quality assurance, Methodology, Measurement, Indexes(Ratios), Health statistics, Health care, Health care indexes, *Health care costs, Demography, Data, Data processing, Data analysis, Cost effectiveness, Communities, Benefit cost analysis.

The cost and benefit incidence of all public programs at Federal, State, and local levels are examined. Government health spending, referred to as benefit incidence, amounted to $18.3 billion in 1969, an average of $91 per person in the U.S. By State, per capita spending ranged from $44 in Mississippi to $148 in New York. Costs are defined as the taxes collected to finance the programs and the cost incidence reflects where the financial burden of each program ultimately rests. In order to calculate the cost incidence, the source of funds for each program is determined. Government health programs are financed in a variety of ways. For example, Medicare is funded through a combination of general revenues, payroll contributions, and enrollee premium payments. The sources of funds are then distributed by State. Federal and State-local funds are shown separately for each State and for each program. It is important to distinquish between the two, mainly because of the different distribution of costs. The assumptions and estimating procedures used in the study and detailed tables for each program and source of funds are contained in the appendix.

HRP-0007324/7GA Not available NTIS
Medical Battalion (1st), Fort Riley, Kans.
Team Approach in Hospital Treatment as a Defense of the Psychiatrist.
Roger Berlin. 1970, 12p
Pub. in Comprehensive Psychiatry v11 n2 p147-157 Mar 70.

Descriptors: Physicians, Organization theory, *Mental health care, Health resources, Health occupations, Health care services.

A possible disadvantage of the team approach in mental health is examined as it relates to certain feminine personality traits of some psychiatrists. The history of the team approach is traced and its contemporary aspects touched on. It is suggested that a psychiatrist's feminine identification and passivity are congruent with those methods of the team approach which foster the sharing of her responsibility and power. Ways in which a psychiatrist's feminine identification allow the team to divest her of executive power are discussed and some possibly harmful effects upon patients are demonstrated. Passive defenses and an abundence of feminine identifications may lead a psychiatrist to relinquish her team responsibility. This sharing of responsibility tends to lessen the impact which the psychiatrist himself personally makes upon patients who, by necessity, become more involved with other team members. By thus deemphasizing the psychiatrist's personal relationship to patients, the team approach may not benefit those patients who experience his more distant involvement with them as a new version of previous parental neglect. Such patients may have difficulty in overcoming the effects of parental neglect because the treatment setting bears too much resemblance to unhappy aspects of their childhood. The relegation of authority by the psychiatrist to other team members may also diminish his sense of professional identity.

HRP-0007379/1GA PC$9.00/MF$3.00
Gorsline (Lester) Associates, San Rafael, Calif.
Guide to Financial Analysis and Introduction to Economic Impact Analysis for Health Planning.
Lucy Johns, Thomas Chapman, and Morton Raphael. Jun 76, 266p DHEW/HRA-76/14513
Contract PHS-HRA-299-74-0005
This is the third monograph in the National Health Planning Information Center's Health Planning Methods and Technology Series.

Descriptors: United States, Standards, Reviewing, Regulation 1122, Projects, Methodology, Manuals, Legislation, Law(Jurisprudence), *Health economics, Health care, Health care delivery systems, Fixed costs, Financial management, Feasibility, Evaluation, Economics, Economic theory, Economic impact, Criteria, Comments, Capital expenditures, Assessments.

A guide is presented to aid health planners in performing financial feasibility review and economic impact analysis of health care service projects. A conceptual approach to the review of financial feasibility is provided as a basis for financial feasibility judgments required under Section 1122 of the Social Security Act of 1972 (P.L. 92-603) and the Certificate of Need Laws. Elements influencing the financial feasibility of capital projects are described, and feasibility is defined. A seven step decision sequence for determining financial feasibility is explained in detail and the decisions and their outcomes are summarized in a decision flow chart which is applicable to any type of project and financing. Data requirements for the determination of financial feasibility are specified and explained. Economic impact and economic impact analysis are defined, and methodologies applicable to some major impact factors are discussed. Issues raised by attention to economic impact are summarized, and data requirements necessary for economic impact analysis are described. An introduction to basic economics is presented in an attempt to provide an understanding of the major assumptions, laws, and concepts involved in general economics and to support an approach to economic impact analysis. A brief introduction to health economics is also included. Institutional finance is discussed, with emphasis placed on elements of accounting and financing such as financial statements, financial ratios, basic concepts, capital budgeting, and cost analysis. An appendix containing Section 1122 of the Social Security Act of 1972 (P.L. 92-603) is provided. References are included.

HRP-0007399/9GA Not available NTIS
Queen's Univ., Kingston (Ontario).
Initial Career Plans and Subsequent Family Practice.
A. S. Kraus, E. H. Botterell, D. W. Einarson, and M. G. Thompson. 1971, 5p
Pub. in Jnl. of Medical Education v46 n10 p826-830 Oct 71.

Descriptors: Statistical distributions, Physicians, Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Health care, Foreign countries, Distribution, Demography, Communities.

The usefulness of questioning medical school applicants about their career plans as a means of selecting students most likely to engage in family practice or to practice in underserviced areas was investigated in a two - pronged study of applicants to the medical school at Queens University, Kingston, Ontario, and alumni of that school. Applicants in the spring of 1970 were asked to respond to questions concerning their reasons for wanting to be a physician, the type of medical work they intended to pursue, and the location in which they might like to practice. In addition, physicians who received their M.D. degrees at Queens from 1949 to 1958 were asked to respond to these questions as they would have upon application to medical school. The study included 100 applicants for the first premedical year, 46 applicants for the first medical year, and 373 alumni (74 percent alumni response). Among the alumni respondents, 55 percent said that their first choice of career plan when they applied to Queens was family practice. Among these, 28 percent never engaged in family practice upon graduation. Strong correlations were found between the location in which alumni respondents actually practiced and that in which they were interested upon application to Queens. Responses by 1970 student applicants were sufficiently variable so as to be judged useful in a selection process. Limitations of the study methodology are acknowledged prior to the conclusion that questions regarding career plans have potential value in the selection process of medical schools. Supporting data are included.

HRP-0007412/0GA Not available NTIS
Sparks Regional Medical Center, Fort Smith, Ark.
Upgrading Nursing Aides.
Charles R. Shuffield. 1970, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v44 n24 p61-64 16 Dec 70.

Descriptors: Vocational guidance, Students, State regions, Retention, Recruiting, Personnel development, Nurses, *Nurse aids, Methodology, Health occupations, *Health manpower education, Health education, Continuing education, Arkansas.

A program to upgrade the nursing aide position at the Sparks Regional Medical Center, Fort Smith, Arkansas is described. The nursing council of the hospital sponsored the program and found it resulted in improved morale and better patient care. As the initial step the following problems were identified: after the aides' initial orientation, no one person had administrative responsibility for the group; there was a need for better screening of applicants; the turnover of aides was too great, especially during the first week following orientation; there was no opportunity for job classification; and morale was low. A nursing coordinator was appointed to recruit aides and monitor their performance, giving assistance where needed. More rigorous selection criteria were established and used for screening applicants. A ten percent reduction in early turnover was accomplished by initiating a 'big sister' program with each new aide assigned an experienced aide to make her feel welcome. The most difficult problem to solve concerned the advancement of the nursing aide within the job classification. Three levels of nursing aide positions were developed. The first year the aide is classified as a nursing aide and is in a learning and adjustment period. On completing one year's employment and receiving a satisfactory grade on a qualifying examination, the aide is advanced to senior nursing aide, and a new position of nurse assistant was created for which a six week training course was developed. Uniforms were changed to white shifts with easily identifiable emblems designating the level of the aide. Nurses' assistants were encouraged to take practical nursing training courses.

HRP-0007433/6GA Not available NTIS
National Inst. on Alcohol Abuse and Alcoholism, Rockville, Md. Special Projects Branch.
Proceedings: Seminar on Public Health Services and the Public Inebriate.
1975, 79p DHEW/ADM-75/218
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $1.40.

Descriptors: Urban health services, Urban areas, Sociology, Socioeconomic status, Socioeconomic factors, Management methods, Health related organizations, Health planning agencies, Health care, Health care services, Demography, Coordination, Cooperation, Communities.

Proceedings of a seminar on public health services and the public inebriate, sponsored in May 1973 by the Division of Special Treatment and Rehabilitation Programs of the National Institute on Alcohol Abuse and Alcoholism, are reported. The purpose of the seminar was to assist in the development of guidelines or policies for community services to public inebriates through establishment of a continuing dialogue between institute staff and representatives of

public and private local organizations dealing with problems of chronic and debilitating alcoholism across the country. Fifteen individuals participated. Papers were presented on the following: public health services and the culture of 'skid row bums,' the role of the law in improving the quality of life of these public inebriates, and interaction between skid row people and law enforcement and health professionals. The discussion session which followed the presentations is also included.

HRP-0007437/7GA Not available NTIS
Podiatric Medical Education Since 1960.
1974, 9p
Pub. in Jnl. of Podiatric Medical Education v5 n1 p5-13 1974.

Descriptors: Universities, Schools, *Medical education, Health resources, Health related organizations, Health occupations, Health manpower, *Health manpower education, Health education, Curricula, Allied health personnel.

The status of podiatric medical education since 1960 is assessed in the context of recommendations from the Selden Commission on podiatry education. The Selden Commission recommended the appointment of full-time faculty members with graduate doctoral degrees in basic sciences and degrees in other professional fields. In 1973-74, the basic science faculty numbered 77; medical doctors, 126; and podiatrists, 253. Qualitative and quantitative changes in faculties are primarily attributed to the availability of Federal funds through institutional and special project grants. The number of student applications in 1973 represents a ten-fold increase over 1960. This can also be attributed to the availability of Federal loans and assistance programs. Approximately 80 percent of 1973 entrants to colleges of podiatric medicine earned at least a bachelor's degree. Following recommendations of the Selden Commission for more laboratory work in basic science courses, organization of courses into broad subject areas, and closer coordination between basic and clinical sciences, five podiatric colleges altered their curriculum to conform with these recommendations. Library staffs and facilities were expanded, as were other physical facilities. Other Selden recommendations for practitioner refresher courses, graduate program, and hospital-based residency were also implemented. Tabular data on podiatric medical education are included.

HRP-0007447/6GA Not available NTIS
Alabama Univ., Birmington. School of Dentistry.
Comparison of Computer - Generated Data with Actual Use of Therapists.
Walter J. Pelton, James B. Dilworth, George A. Overstreet, and Olice H. Embry. 1972, 5p
Grant PHS-HS-00785
Pub. in Jnl. of Dental Education p21-25 Feb 73.

Descriptors: System analysis, State regions, Productivity, Methodology, Medical personnel, Measurement, Health occupations, Health manpower, Health care, Health care utilization, Dentists, Data processing, Data processing systems, Data analysis, Alabama.

Statistical tests performed to compare computer simulation data with actual dental therapist practice data are documented. A study of treatment time, productivity, cost, and income associated with the use of various combinations of dental auxiliaries has been underway at the University of Alabama School of Dentistry since 1969. The study is based on surrogate practice which incorporates many of the features of a private practice. The objectives of the study are to determine how much more service could be provided by using therapists, how profitable such a practice is, and how therapists and other auxiliaries might be used to best advantage. A computer model based on flow charts and time distributions from the surrogate practice was developed to simulate a dental practice. Statistical tests comparing computer simulation data with real practice data indicate that computer models can be used to simulate the dental practice from which time distributions for the model are obtained. With time distributions representing one practitioner or an average of many practitioners, such models provide meaningful data about the productivity, cost, and revenue of a typical dental practice. Manipulation of the team mix used in the computer model provides information about the impact of various team mixes on the average dentist's practice. Supporting data and a schematic flow chart are included.

HRP-0007461/7GA PC$4.50/MF$3.00
Public Health Service, Rockville, Md. Office of Professional Standards Review.
National Professional Standards Review Council: Third Annual Report.
30 Jul 75, 53p
See also the 'Second Annual Report' available as HRP-0007462.

Descriptors: *PSRO(Professional Standards Review Organizations), *Professional standards review organizations, Physicians, National government, *Health resources, Health related organizations, Health occupations, Government agencies.

The Fiscal Year 1975 activities of the National Professional Standards Review Council, directed toward accomplishment of the purposes and objectives of legislation implementing the Professional Standards Review Organization (PSRO) program, are described in a report to Congress from the Secretary of Health, Education and Welfare. The National Council is composed of 11 physicians appointed by the Secretary. The duties of the Council include advising the Secretary in the administration of PSRO legislation, providing for development and distribution of information among Statewide PSRO organizations, reviewing the operation of these organizations, and conducting studies relative to the effective development of PSROs. Council activities for FY 1975 are reviewed in the following areas: norms, standards, and criteria; delegation of review to hospitals; continuing medical education; review of ancillary services; long-term care review; presentation to the Council by conditional PSRO representatives; development of Memoranda of Understanding; composition of governing bodies of PSROs; physician reimbursement for review activities; PSRO Statewide Support Center presentation; PSRO information and data systems; confidentiality of data and information; evaluation; utilization review regulations; program review teams; private initiative in PSRO; consumer presentation to the Council; national high blood pressure education program; budgetary restrictions; and other areas. National Council plans for FY 1976 are outlined, and special issues of importance to the PSRO program are highlighted, including support of physicians and other interested groups for PSRO, expansion of PSRO review to nonfederal payment patients, national health insurance, malpractice, and relationship of PSRO with other health legislation. Supporting documents, including a list of PSRO contracts for FY 1975, are appended.

HRP-0007469/0GA Not available NTIS
Miami Univ., Fla. School of Medicine.
Interprofessional Student Health Teams.
Libby A. Tanner, and Ethel J. Soulary. 1971, 5p
Pub. in Nursing Outlook v20 n2 p111-115 Feb 72.

Descriptors: Universities, State regions, Schools, Projects, Organization theory, Medical education, Health resources, Health related organizations, Health manpower, *Health manpower education, Health education, Health care services, Health care delivery, Florida, Curricula.

A demonstration project undertaken at the University of Miami to provide interdisciplinary training for medical, nursing, and social work students is described. The project included ten student health teams, each composed of a medical student, a nursing student, and a social work student. Each team provided comprehensive health care to one family in an evening clinic over a seven-month period during the 1970-71 academic year. Overall program activities for the students included health maintenance and illness visits at the center, home visits, health team conferences with instructors, and monthly seminars. Initially, the majority of the health teams looked to the social work student as an informal leader. As the project progressed and when the home visit was made, student leadership was shared, but the presence of the faculty preceptor seemed to mitigate student initiative to some degree. In situations where the medical student saw himself as the group leader, initial and subsequent planning sessions appeared to be less productive. Introducing students into the project during the primary phase of their professional education appears to have profoundly affected the results of the project. Anxiety and inexperience of students who had just entered their professional courses were ever-present problems. Lack of provision of college credit for the program was also found to be an obstacle, as was the voluntary nature of the project. Objective and subjective evaluations of the project's outcome are presented. It is concluded that future interdisciplinary education programs should draw nursing and medical student participants from higher educational levels, and should provide opportunities for credit courses involving shared experiences.

HRP-0007488/0GA Not available NTIS
Cornell Univ., New York. Medical Coll.
Community Participation for Equity and Excellence in Health Care. General Discussion I.
Sidney M. Greenberg. 1970, 6p
Pub. in New York Academy of Medicine v46 n12 p1048-1053 Dec 70.

Descriptors: State regions, Physicians, New York, Management methods, Local government, Health related organizations, Health planning agencies, Health occupations, Consumers, Community relations.

A discussion among participants in the 1970 Health Conference of the New York Academy of Medicine concerning community participation and equity of health care is reported. Concern is expressed by representatives of several community health projects that funds intended for use in the community often are used instead to meet overhead expenses of agencies and institutions. The importance of active patient participation in health care and of community representation in policy-making is cited by another representative. The question is raised as to how communities might develop self-sufficiency in financing and managing health programs. A representative from the Detroit Model Neighborhood Health Council calls for the health professionals -- physicians and nurses -- to 'come into our communities' so that health packages might be designed as a joint effort. In a discussion of the role of health professionals in helping communities to obtain their goals, concern is expressed over the possibility that professionals seek community participation and community 'control' only when it is certain that the community group is going to agree with the health establishment.

HRP-0007494/8GA Not available NTIS
Montefiore Hospital, Bronx, N.Y.

Primary-Care Health Team.
Harold Wise. 1972, 7p
Pub. in the Archives of Internal Medicine v130 n3 Sep 72.

Descriptors: Urban health services, Urban areas, State regions, Specialists, Registered nurses, Physicians, Organization theory, Nurses, New York, Health resources, Health related organizations, Health occupations, Health manpower, *Health care services, Allied health personnel.

The experience of the Dr. Martin Luther King, Jr. Health Center in South Bronx, New York is reviewed in relation to the development of interdisciplinary health care teams. The purpose of the center is to make appropriate health workers available on the basis of family need and not to develop a rigid team model. While the family health worker usually is the prime contact with a particular family, any member of the team may serve in that role. Roles of the following team members are outlined: public health nurse practitioner, family health worker, and the physician. The center has eight health teams serving some 12,000 families. Each team consists of two public health nurses, six family health workers recruited from the community, an internist, and a pediatrician. Specialized back-up services are provided by a part-time psychiatrist and a mid-wife. Each team is assigned a health advocate and a dentist. The public health nurse serves as team coordinator, as supervisor of family health workers, and as a practitioner. Problems encountered in implementation of the team approach are described. These stem primarily from the inadequacy of physician and nurse training with regard to team practice and the diversity of cultural and economic backgrounds of team members. Issues of power and leadership, intrateam conflicts resulting from team members assuming familial relationships, and problems of communication are discussed in terms of team effectiveness. The importance of training potential health team members to function as members of a team is stressed.

HRP-0007504/4GA Not available NTIS
Jefferson Medical Coll., Philadelphia, Pa. Office of Medical Education.
Factors Involved in Comprehensive Patient Care Evaluation.
Joseph S. Gonnella, and Carter Zeleznik. 1974, 7p
Pub. in Medical Care v12 n11 p928-934 Nov 74.

Descriptors: System analysis, Quality assurance, Methodology, Measurement, Mathematical models, *Health care, Data processing, Data processing systems, Data analysis.

Limitations within existing approaches to outcome-oriented patient care evaluation are identified and an expanded approach is described. The proposed model provides for statistical analysis of factors contributing to the quality of care. The model is explained in terms of a two - dimensional matrix involving a comprehensive statement of outcomes and a consideration of the full range of variables which may affect those outcomes. This matrix is presented in the form of an equation Y(i) =f(X(i)) where Y(i) represents a set of outcomes such that Y equals: (1) the potential prevention of the problem and its point of recognition; (2) the patient dysfunction caused by the problem; and (3) the impact of the problem on the patient's family and on the community. X(i) stands for a set of variables such that X equals: (1) the performance of the physician; (2) the adequacy of the technical setting in which the care was provided; (3) the patient receiving the care; and (4) the social and physical environment in which the care was provided. Case histories are included showing how this matrix can be used to generate meaningful process criteria (i.e., criteria related to remedial processes which lead to specified outcomes) and how failure to employ the full matrix may lead to inappropriate remedial action. A tabular delineation of the matrix accompanies the text.

HRP-0007506/9GA Not available NTIS
Rochester Univ., N.Y. School of Medicine and Dentistry.
Acceptability of an Expanded Nurse Role to Nurses and Physicians.
David E. Reed, and Klaus J. Roghmann. 1971, 6p
Pub. in Medical Care v9 n4 p372-377 Jul-Aug 71.

Descriptors: State regions, Research, Registered nurses, Physicians, *Nurses, New York, Job analysis, Health resources, Health occupations, Health manpower, Health care utilization, Health care delivery.

The methodology for and findings of a study on the acceptability of an expanded nurse role to nurses and physicians are described. The main purpose of the study was to determine the extent to which continual redefinition of the nurse role (through addition of new tasks) hinders development of professional identity. A questionnaire developed to measure the acceptance of an expanded role for nurses was administered to 218 persons: 93 nurses, 86 house staff physicians, and 39 senior medical students. Duplicate questionnaires were filled out by medical students before and after a period of clinical training in which an expanded nurse role was stressed. Results of the survey indicate that the questionnaire is a good measure of attitude. Nurses found the expanded role more acceptable than did medical students. Attitudes of medical students did not change after a year of clinical experience. House staff physicians found the expanded nurse role least acceptable. Intragroup variations were great, and motivational factors outside the professional field were of greater importance than direct clinical experience in determining acceptance levels. Variables related to the professional sphere were of intermediate relevance. Younger personnel who had not yet been indoctrinated with rigid role prescriptions were found to be most receptive to role change. Tabular data are included; a copy of the questionnaire is not provided.

HRP-0007516/8GA Not available NTIS
San Francisco State Coll., Calif.
Coalition to Adversary: Citizen Participation in Three Federal Programs.
Melvin Mogulof. 1969, 8p
Pub. in the American Institute of Planners v35 p225-32 Jul 69.

Descriptors: United States, Management methods, Local government, Health related organizations, Health planning agencies, Consumers, Community relations.

The strength of neighborhood involvement is assessed for three Federal programs, all of which had the goal of neighborhood representation on governing coalitions. While the Kennedy Administration's Juvenile Delinquency Demonstration Program sought to involve affected populations in policy formulation, the involvement was primarily in an advisory rather than a decision-making capacity. This demonstration program evolved a governing coalition with no significant neighborhood representation and, in retrospect, neighborhood involvement was minimal. Juvenile delinquency programs were more concerned with issues of neighborhood organization than with means of including neighborhood residents on governing coalitions. Neighborhood representatives controlled the governing coalitions in the Office of Economic Opportunity's Community Action Program and held policy-makers accountable to the neighborhood constituency. The formation of multiservice neighborhood centers and other neighborhood - based service delivery centers was common; such neighborhood organization was concerned with linking services to the people. The governing coalitions of Model Cities programs are dominated by neighborhood residents who view the government as an adversary rather than as a partner. The trend in neighborhood involvement has been from the public - private coalition of juvenile demonstration programs, through expansion of the governing coalition in community action programs, to an adversary relationship between the government and the neighborhood under Model Cities programs.

HRP-0007569/7GA Not available NTIS
Illinois State Dept. of Public Health, Springfield. Bureau of Emergency Medical Services and Highway Safety.
Ambulance Strategy for Illinois.
David R. Boyd, Michal K. McGrady, Carol E. Anderson, and Winifred Ann Pizzano. 1973, 6p
Grants PHS-GH-18003, PHS-HSM-110-75-345
Pub. in Illinois Medical Jnl. v144 n5 Nov 73.

Descriptors: Urban health services, Urban areas, Rural health services, Rural areas, Plans, Physicians, Methodology, *Illinois, Health planning, Health occupations, Health manpower, Health care services, Health care delivery, *Emergency medical services, Development, Data acquisition.

A framework for planning and implementing ambulance services in Illinois, considered to be the most obvious deficiency in the State's Emergency Medical Services (EMS) system, is presented for physicians, hospital administrators, medical providers, health planning groups, and emergency medical services councils. The strategy for ambulance service planning is designed to: (1) build on existing medical resources; (2) consider the population density in need of ambulance services; (3) integrate highways, roads, and access points for ambulance service response; and (4) account for all highway - related accidents and deaths. Also incorporated into the strategy is a notation of special emergency medical problems relevant to any specific community. The strategy involves three types of communities in Illinois: Chicago and surrounding suburban areas, downstate metropolitan cities (population over 50,000), and downstate rural areas. The strategy defines 176 rural ambulance services districts for downstate Illinois, ranked on a capability / needs basis which provides a basis for planning and promoting upgraded ambulance services in rural communities. A case study is cited of how one community solved its emergency transportation needs by using a 24-hour ambulance service stationed at a local prison clinic, training and utilizing both residents and interested community persons, and providing a positive rehabilitation program at the prison.

HRP-0007577/0GA PC$4.00/MF$3.00
Comprehensive Health Planning Council of South Florida, Inc., Miami.
Analysis of the School Health Program in Model Cities and Fringe Area.
Raymon Thornton. 1970, 28p

Descriptors: State regions, Research, Public health, *Health education, Health care services, *Health care delivery, Florida.

Conditions affecting health care and health education in public schools in the model city area of Dade County, Florida are documented in an attempt to determine what needs to be done to provide adequate, high - quality health care to all students residing in the model city area. Questionnaires were completed by 20 schools concerning health instruction, health services, and school health environment and safety. Personal interviews were conducted

with key persons in each school on that school's health problems, and statistics were collected from the family health center and Dade County Department of Public Health. The following findings were revealed for the model city area: the school nurse is available only three hours a week; no school teaches a direct course in health instruction; there is no emergency clinic at several schools; classes are frequently disturbed by airplane noise; all schools utilize the services of various community health agencies; and additional nurses are needed to provide adequate health care for students. Elements comprising a properly conceived school health program and approaches to an adequate program are discussed. Goals and recommendations for an effective school health program are suggested.

HRP-0007590/3GA Not available NTIS
Denver Univ., Colo. Center for Social Research and Development.
Rural Social Problems, Human Services, and Social Policies. Working Paper 8: Health.
Janet Morton Derr. Sep 73, 33p
Grant SRS-9-56027
This document is related to HRP-0007591 and HRP-0007592 available from the University of Denver, CSRD, 2142 South High St., Spruce Hall Rm. 21, Denver, Colorado 80210.
Available from the University of Denver, CSRD, 2141 South High St., Spruce Hall Room 21, Denver, Colorado 80210, $1.00.

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, *Rural health services, Rural areas, Research, Health status indexes, Health statistics, Health care, Health care services, Health care delivery, Demography, Data, Communities.

As part of a series of 13 working papers dealing with the problems, services, and policies affecting rural populations, the findings of a review of literature pertaining to health status and resources of rural populations are reported. It is noted that a comparison of a broad range of rural and urban health care statistics indicates the inadequacy of rural health care systems, particularly with respect to the rural poor. Isolation and poverty combine to create barriers to the development and utilization of efficient and effective health care systems in rural areas. Although aggregate health expenditures for the Nation more than doubled between 1960 and 1968, comparisons of selected health characteristics for rural and urban children and youth for 1958 and 1968 show no appreciable improvement in rural health status, with the sole exception of health insurance coverage. It is concluded that unless intensive remedial measures are developed, the health status gap between rural and urban areas is not likely to disappear. The 'small but growing' number of pilot health care projects focusing on the delivery of medical services in rural areas is noted. Discussions of health status, medical manpower and facilities, health services utilization and delivery modes, and auspices and financing of rural health services, drawn primarily from materials published between 1962 and the beginning of 1972, are included.

HRP-0007592/9GA Not available NTIS
Denver Univ., Colo. Center for Social Research and Development.
Rural Social Problems, Human Services, and Social Policies. Working Paper 11: Nutrition.
Janet Morton Derr. Sep 73, 29p
Grant SRS-9-56027
This document is related to HRP-0007590 and HRP-0007591 available from the University of Denver, CSRD, 2142 South High St., Spruce Hall, Rm. 21, Denver, Colorado 80210.
Available from the University of Denver, CSRD, 2142 South High ST., Spruce Hall, Room 21, Denver, Colorado 80210, $1.00.

Descriptors: *Rural health services, Rural areas, Research, *Nutrition, Health care, Health care services, Health care delivery, Demography, Communities.

Based on a review of materials published between 1962 and 1972, a discussion of nutrition problems in rural populations is presented as one in a series of 13 working papers on the problems, services, and policies affecting the well-being of rural populations. It is noted that, while the United States long has been involved in nutrition programs in underdeveloped nations, it has been only since 1968 that hunger and malnutrition have become a topic of domestic concern. Of five identified high-risk population subgroups with regard to malnutrition, four are rural. The five groups are: the unemployed or partly employed rural poor, migrant workers, reservation Indians, the poor in large cities, and Alaskan Indians and Eskimos. It is noted that data on food and nutrition from food stamps, commodity distribution, and child nutrition and nutrition supplement programs seldom are broken down into rural and urban components. While support of food and nutrition programs has been expanded in recent years, the sum of available evidence indicates that the range of programs serves rural residents less uniformly and less adequately than urban residents. It is observed that interpretation and implementation of nutrition-related programs vary widely among localities, and that parochial attitudes tend to be more common in rural programs. It is noted that nutrition education programs serving low income populations must be coordinated with food assistance programs for maximum effect, the value of the education programs being dependent on the actual access of clients to adequate diets.

HRP-0007602/6GA Not available NTIS
Southern Illinois Univ. School of Medicine, Carbondale.
Living: Health, Behavior and Environment. Edition Number Six.
Charles E. Richardson, Fred V. Hein, and Dana L. Farnsworth. 1975, 566p
Available from Scott Foresman and Co., 1900 E. Lake Ave., Glenview, Ill. 60025, $9.24.

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, Occupational safety and health, Nutrition, *Mental health care, Medical services, Health care, Health care services, *Environmental health, Demography, Communities.

Health issues are discussed that focus on concern for the whole person with interacting emotional and physical needs as well as wide-ranging factors involved in a lifestyle that may be chosen in a changing environment. An introduction to the book provides a color overlay of the human body and correlated descriptions of primary organ systems. Emotional well-being is discussed as are approaches to and results of coping with stress. Major emphasis is given to positive elements and programs of mental health, and psychiatric treatment regimens are de-emphasized. Special emphasis is placed on nutrition, physical fitness, and body care. These highly defined content areas are personalized to reflect scientific and rational bases for daily decision-making. Popular misconceptions about nutrition and fad behavior and the cultural trends which underly these concepts are discussed. In other chapters, family living is discussed in terms of sex and sexuality, marriage, and marriage and family relationships. Hazards to living are noted, including drugs, accidents, infectious diseases, and chronic and degenerative diseases. Living in the community is discussed in relation to environment and ecology, community health resources, and personal health care services. A glossary and index are provided.

HRP-0007629/9GA Not available NTIS
Harvard Medical School, Boston, Mass.
Attitudes and Satisfactions of Low Income Families Receiving Comprehensive Pediatric Care.
1969, 8p
Grant PHS-HS-11874
Pub. in the American Jnl. of Public Health, v60 n3 p499-506 Mar 70.

Descriptors: State regions, Research, Quality assurance, Methodology, Measurement, Massachusetts, Health care, Health care services, Health care delivery, Ambulatory health care.

A study on changes in attitudes and satisfaction among low income families provided with comprehensive pediatric services is reported. The study involved a stratified sample of 750 low income families selected from users of the Boston Children's Hospital Medical Center Emergency Clinic. This sample was randomly assigned to an experimental group who received comprehensive, family - focused pediatric care for three years; an attention control group; and a nonattention control group. Approximately 250 families were included in each group. Experimental and attention control families were interviewed at the beginning of the study and at six-month intervals throughout a three-year care period. Nonattention families were interviewed at the beginning of the study and at the end of the three-year period. Attitudes and levels of satisfaction with care received were compared after three years for all groups. While there were no changes noted in such general attitudes as alienation, acceptance of the maternal role, and preventive health practices, increased satisfaction with delivered care and increased preference for a primary care physician were observed in the experimental group. The changes noted were most striking in those areas involving the actual delivery of care, suggesting that a major impact on fragmented medical care of the poor will result only if there are major changes in the services offered. Supporting tabular data and details of the study methodology are included.

HRP-0007640/6GA Not available NTIS
American Hospital Association, Chicago, Ill. Bureau of Research Services.
Analysis of Chain-Operated For-Profit Hospitals.
Bernard Ferber. 1971, 11p
Pub. in Health Services Research v6 n1 p49-60 1971.

Descriptors: United States, Statistical distributions, Research, Profit, Private organizations, Private institutions, Nonprofit, Health resources, Health related organizations, Health care, Health care facilities, Health care delivery, Distribution, Demography, Communities.

Baseline data for hospitals owned and operated for profit by public stock corporations are compared with privately owned profit hospitals and with nonfederal, nonprofit short-term general and special hospitals. Data collected in 1969 are presented on the number of hospitals, number and location of beds, approval status and presence of selected services, average length of stay, occupancy and staff ratios, and expense rations. It is noted that chain-operated hospitals tend to be larger and include a greater proportion of American Hospital Association members than other profit hospitals, and are located in metropolitan areas. They exceed profit hospitals in accreditation and Medicare certification and have higher personnel ratios and higher figures for expense per inpatient day and expense per admission. Distinctions between chain-operated and nonprofit hospitals are less clear, partly due to size. Most chain-operated hospitals are in the 50-99 bed category while nonprofit hospitals are distributed fairly evenly among size categories. Regional distributions generally reflect various

restraints on profit hospitals. Internship programs are usually concentrated in larger nonprofit hospitals. Fewer chain than nonprofit hospitals have outpatient or home care programs, but more have inhalation therapy departments and intensive care units. It is suggested that chain hospitals are better able to effect economies of scale, serve a somewhat different patient mix, and tend to use personnel more efficiently than other types of hospitals.

HRP-0007641/4GA Not available NTIS
National Academy of Sciences, Washington, D.C.
Some Ecological Differentials in the Use of Medical Services.
Rashid L. Bashshur, Gary W. Shannon, and Charles A. Metzner. 1971, 14p
Grant PHS-CH-00274
Pub. in Health Services Research v6 n1 p61-75 1971.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, Physicians, Ohio, *Medical services, Indexes(Ratios), Health statistics, Health manpower, Health care, *Health care utilization, Health care indexes, *Health care facilities, Dentists, Dental services, Demography, Data, Communities.

Patterns of travel to medical care facilities are investigated to determine the extent to which a sample of urban residents used the facilities nearest their homes and to explore some social and location variables associated with their deviation from minimal travel. Data were obtained from a health care sample survey conducted in the metropolitan area of Cleveland, Ohio in 1967. The area was divided into four concentric zones, with zone I representing the central city and zone IV distant suburban areas. Demographic characteristics included race, education, and income. Travel patterns to hospitals, physicians, and dentists, according to socioeconomic background, are presented in tabular format. A negative relationship was observed between distance to and utilization of a health care facility. It was concluded that there is a distance range beyond which people are unable or unwilling to travel to obtain medical care. A simple gradient hypothesis, however, was not sufficient to explain differences within the area, and this explanation applied only to the density distribution of users around a specific facility rather than to total users who may be seeking alternative sources of service. Hospital boundary lines could not be established, and the choice of hospital or of physician was not necessarily based primarily on accessibility. Other factors that influenced distance traveled to obtain medical care included the nature of roads and streets, public or private means of transportation, user values, ethnicity, severity of medical problem, and ability to pay.

HRP-0007642/2GA Not available NTIS
Chicago Univ., Ill. Center for Health Administration Studies.
Physician Referral Process: A Theoretical Perspective.
Stephen M. Shortell, and Odin W. Anderson. 1971, 10p
Pub. in Health Services Research v6 n1 p39-48 1971.

Descriptors: *Physicians, Health occupations, *Health economics, Health care, Economics, Economic theory.

The behavior of physicians in referring patients to other physicians is considered from the standpoint of social costs and rewards to interacting physicians, and the implications of referral for quality of care and costs to patients, are discussed. Tables present data on the percent of patients received on referral from professional sources according to type of practice, rates of referral by specialty and type of community, and typical referral relationships identifying the 'referring' and 'referred to' physicians and where reciprocity exists between the two groups. Exchange theory is offered as a framework for conceptualizing and analyzing various aspects of the referral interaction, and relevant variables for investigation are identified. Exchange theory sees the individual as being motivated to interact with another individual in an activity if he expects the association to be in some way rewarding to himself. The heart of the exchange theory lies in the analysis of outcomes (rewards minus costs) versus comparison levels. The importance of the referral process is stressed, and elements of and patterns inherent in such a process are detailed. Exchange theory is related to physician referral behavior.

HRP-0007649/7GA Not available NTIS
Johns Hopkins Univ., Baltimore, Md. Dept. of Medical Care and Hospitals.
Planning Personal Health Services: A Markovian Model.
Vicente Navarro. 1969, 8p
Grant PHS-CH-00158
Pub. in Medical Care v7 n3 p242-249 May-Jun 69.

Descriptors: System analysis, Strategy, Methodology, *Health planning, Health care, Health care utilization, Forecasting, Data processing, Data processing systems, Data analysis.

A Markovian planning model is presented which takes into account dynamics of the health services system and allows health planners flexibility in a continuously changing environment. An analysis of the Markovian model leads to three applications: (1) prediction, determining future requirements for manpower and resources for any population defined in terms of desired or specified demographic and / or epidemiologic characteristics; (2) simulation, analysis of changes in the health services system and / or in demographic or epidemiologic variables and repercussions of these changes on present and future resources; and (3) goal seeking, design of several alternative strategies for reaching specified utilization patterns or organizational arrangements and choice of the best alternative according to defined constraints such as cost or minimum changes in resources. These model applications are demonstrated in different situations, drawing empirical data from diverse sources. Within the conceptual framework of the model, levels of care and the composition of population groups can be changed to meet desired criteria. Supporting data and flow diagrams are included.

HRP-0007651/3GA Not available NTIS
Yale Univ., New Haven, Conn. School of Medicine.
Development of Standards for the Audit and Planning of Medical Care: Pathways Among Primary Physicians and Specialists for Diagnosis and Treatment.
Hyman K. Schonfeld, Isidore S. Falk, Paul H. Lavietes, Saul S. Milles, and S. Jack Landau. 1967, 14p
Pub. in Medical Care v6 n2 p101-114 Mar-Apr 68.

Descriptors: Research, *Physicians, Methodology, Medical services, Measurement, Health occupations, Health care, *Health care utilization, Health care delivery.

Pathways which may be followed by primary physicians and specialists for diagnosis and treatment are noted. Data were collected from primary physicians concerning the content of good medical care in about 250 categories of disease or disorder, through more than 600 structured interviews with 36 internists and 21 pediatricians. Subsequently, specialist physicians involved with internal medicine, pediatrics, surgery, radiology, psychiatry, and obstetrics and gynecology were interviewed. About 60 diseases applicable to three population groups (children, adults under 65 years of age, and adults 65 years of age or older) were studied in terms of specialist physicians. Three diseases -- myocardial infarction, essential hypertension, and carcinoma of the large intestine and rectum -- were selected to illustrate the methodology used in tabulating and presenting the kinds of physicians required for major pathways. Pathways for each disease were recommended in terms of sequences of physician participation in good patient care. Implications relating to similarities and differences in the opinions of primary physician internists and referral specialists were discussed. It was felt that pathways for diagnosis and treatment should be utilized for an understanding of medical care processes and should be considered for introduction into the methodology of a medical care audit. This would make it possible to compare the pathways by which various types of patients presently pursue medical care with those thought by medical profesionals to be desirable.

HRP-0007656/2GA Not available NTIS
Public Relations for Nursing Homes.
John Philip Bachner. 1974, 167p
Available from C.C. Thomas Pubs., 301-307 E. Lawrence Ave., Springfield, Ill. 62703, $11.75.

Descriptors: Public relations, Management methods, Health related organizations, Health planning agencies.

Procedures are outlined which nursing home administrative personnel can utilize in the development of effective public relations programs. The book is divided into two major sections. The first discusses a wide range of general programs suitable for application to any public group. These programs cover the use of in-house communications, news releases, newsletters, publishing of articles, advertising, and other public relations tools. Numerous examples and models are provided. The second section investigates employee relations and the specific needs of particular public groups. It is noted that one of the primary purposes of public relations is to control as much as possible the projection of an image. In this regard, two important considerations are identified. First, it is imperative that information communicated is appropriate to the public involved. Therefore, it is necessary to adjust image-forming material to the situation at hand and the public involved. Second, the image must be truthful. It is felt that the procedures outlined will enable nursing homes to mount a significant public relations effort at a fraction of the cost of what would normally be required.

HRP-0007658/8GA Not available NTIS
Texas Univ. Health Science Center, Houston. School of Public Health.
Consideration of Mortality in Three Subcultures.
Robert E. Roberts, and Conelius Askew. 1971, 8p
Pub. in Health Services Report v87 n3 p262-269 Mar 72.

Descriptors: Vital statistics, Texas, Surveys, State regions, Sociology, Socioeconomic status, Socioeconomic factors, *Mortality, Methodology, Health care, Demography, Data collection, Data acquisition, Communities.

Mortality rates of Mexican - Americans (Chicanos) were examined to determine if they differed from those of Negroes and Anglos.

Mortality data from Houston, Texas were obtained for the period between 1940 and 1967. Some 200,000 death records were screened and all those persons with a Spanish surname were coded as such. Population data were obtained from Bureau of the Census reports for 1950 and 1960. Using the U.S. population in 1950 as a standard million, age-adjusted death rates were computed for Houston in 1950 and 1960. Using deaths for the years 1949-51 and 1959-61, three-year average rates were constructed for both decades for each sex in the three ethnic groups. Data analysis entailed comparisons of ethnic and sex differences in mortality in 1950 and again in 1960 and of changes in mortality patterns for each sex by ethnic group between 1950 and 1960. Study data indicated that, for the population and time periods examined, mortality rates of Chicanos differed from those of Negroes and Anglos in that rates were higher. Males and females of both minority groups (Chicanos and Negroes) experienced a greater force of mortality in 1950 and 1960 than their Anglo counterparts. Both ethnic minorities approximated Anglo mortality rates to a much greater extent in 1960 than in 1950, an outcome which could conceivably be attributed to increasing sociocultural similarities among the groups.

HRP-0007659/6GA Not available NTIS
Social Security Administration, Washington, D.C. Div. of Health Insurance Studies.
Private Health Insurance in 1973: A Review of Coverage, Enrollment, and Financial Experience.
Marjorie Smith Mueller. 1974, 20p
Pub. in Social Security Bulletin p21-40 Feb 75.

Descriptors: United States, Prepaid health care, Personal payment, Patients, Inpatients, Individual payment, Health resources, *Health insurance, Health care facilities, Health care delivery, Health care costs, Financing, Ambulatory health care.

The adequacy of private health insurance in meeting the health care needs of the United States is examined, along with the coverage, enrollment, and financial experience of the health insurance industry. In 1973, about 75 percent of the civilian population were covered by private health insurance for substantial portions of hospital and surgical care costs. The health insurance industry (Blue Cross-Blue Shield; other insurance companies; independent community, employer-employee-union, and private group clinic plans; and health maintenance organizations) paid for most costs of in-hospital physician visits, outpatient x-ray and laboratory examinations, and hospital and surgical care costs. Private insurers returned $21.6 billion (88 percent) of subscriber premiums in the form of such payments. Insurance companies continued to dominate the market in providing coverage for hospital and physician services, prescription drugs, dental care, and most nursing services. The economic stabilization program ccntinued to be a factor throughout 1973 in the slower rate of growth for both income and benefits; the gap between growth rates of income and benefits narrowed as well. Additional financial data are presented in tabular format. Data were derived from information provided by the Health Insurance Association of America, the Office of Research and Statistics, and Blue Cross-Blue Shield.

HRP-0007662/0GA PC$3.50
Missouri Univ.-Columbia. Dept. of Economics.
Federal Government Health Manpower Research and Development.
Johna J. Doing. 1974, 21p

Descriptors: United States, Research and development, Projects, National government, *Health resources, Health related organizations, Health occupations, *Health manpower, Health care delivery, Government agencies.

Federal research and development activities concerned with health manpower other than physicians and dentists are summarized. While a large number of agencies have health-related interests, this report primarily considers efforts of the Department of Health, Education, and Welfare. The emphasis of health manpower research (as of 1974) is on primary care and Federal legislation and regulations, dealing almost exclusively with primary care. General project areas which reflect this emphasis are: training for physicians in family practice and community medicine, use of physician extenders to extend primary care, flexibility of job roles, and mobility of allied health occupations. The Bureau of Health Services Research, DHEW is the major source of research funds, and its major objectives fall into five categories: (1) planning, regulation, and licensure; (2) productivity of health services; (3) economic analysis; (4) quality of health care; and (5) health care data and information systems. Within the Bureau of Health Resources Development, DHEW research efforts are carried out categorically by profession. Recommendations include an interagency group on mid-level health manpower evaluation, and coordination of all health manpower research efforts. Organizational charts of various Federal agencies are included. Portions of this document are not fully legible.

HRP-0007673/7GA PC$4.00/MF$3.00
Health Insurance Association of America, Chicago, Ill.
Report on Miami, San Diego and St. Louis HIAA Grant Demonstration Planning Projects: July 1970-June 1973.
1973, 40p

Descriptors: Strategy, State regions, State government, Regions(United States), Projects, Missouri, Methodology, Local government, Health resources, Health related organizations, Health planning, *Health care delivery, Government agencies, Florida, California.

Health planning demonstration projects sponsored by the Health Insurance Association of America and the Department of Health, Education and Welfare in the cities of Miami, Florida, San Diego, California, and St. Louis, Missouri, are described. Each city's health planning council was provided a cash grant to carry out planning activities within the following broad operational guidelines: (1) a task force with a majority of consumer members representing all vested interest parties would participate; (2) a pragmatic, action-oriented approach would be adopted; (3) the basic planning process of description, goal-setting, analysis, development of recommendations, and implementation conforming to the overall planning efforts of each health planning council would be followed; and (4) each city would coordinate its efforts with those of the other two cities for the sake of comparison. Each planning project is described, and common problems and findings among the three projects are pointed out. Among the findings shared by all three cities were: (1) existing financing mechanisms do not adequately serve all persons in the community; (2) financing has not developed around the needs of patients; and (3) Medicare coverage is limited, and interpretations of Medicare regulations are inconsistent.

HRP-0007675/2GA PC$4.50
Community Service Council, Inc., Birmingham, Ala.
Health Manpower Survey: Section Two - Dentists - Region III, Alabama.
Apr 75, 51p
See also Section One, Physicians, available as HRP-0007676.

Descriptors: Surveys, Supplies, Statistical distributions, State regions, Reserves, Methodology, Medical personnel, Measurement, Inventories, Health resources, Health occupations, *Health manpower, Health care, Distribution, *Dentists, Demography, Data collection, Data acquisition, Communities, Alabama.

Findings of a survey of dentist manpower in the six counties of Region III, Alabama, are reported. The survey, the second of a two-part study of physicians and dentists in the Region, was conducted in November 1974. A two-part questionnaire was utilized, the first part completed by all dentists, and the second completed only by self-employed private practitioners. Of the 370 questionnaires mailed out, 192 responses were received, representing a 52 percent response. Survey findings are described in the following areas: (1) geographic information, including geographic distribution by specialty, distribution by practice location and residence, mobility of practice, and patient service areas; (2) employment characteristics, including activity status, year licensed to practice, primary specialty, and primary form of employment; (3) dental practice characteristics by county area, including setting of primary activity, average weeks worked per year, average hours spent in practice per week, and total number of patients seen in an average week; and (4) information on utilization of dental personnel, provided by self-employed dentists only. Copies of the survey questionnaire and of correspondence relating to the decision not to implement an attitudinal survey are appended. Tabular data accompany the narrative report of the survey findings. Portions of this document are not fully legible.

HRP-0007716/4GA Not available NTIS
Cornell Univ., Ithaca, N.Y.
Location of Emergency Service Facilities.
Constantine Toregas, Ralph Swain, Charles Revelle, and Lawrence Bergman. 7 Oct 70, 11p
Pub. in Operations Research v19 n6 p1363-1373 Oct 71.

Descriptors: System analysis, Statistical distributions, Methodology, Health resources, Health care, Health care services, *Health care facilities, *Emergency medical services, Distribution, Demography, Data processing, Data analysis, Communities.

A technique is developed for determining the optimum number and location of emergency service facilties to provide desired services for a given region. The technique views the location of emergency facilities as a set-covering problem with equal costs in the objective. The sets are composed of the potential facility points within a specified time or distance of each demand point. One constraint is written for each demand point requiring 'cover, ' and linear programming is applied to solve the covering problem, a single - cut constraint being added as necessary to resolve fractional solutions. With the maximum time or distance that separates a user from the closest service as a crucial parameter, the problem described is seen as most applicable to the location of emergency services such as fire stations. The technique may, however, be applied to location of nonemergency services as well. Computations and diagrams accompany the text.

HRP-0007721/4GA Not available NTIS
Emergency Departments and the Non-Emergency Deluge.
1970, 6p
Pub. in Medical World News v11 n52 p23-28 25 Dec 70.

Descriptors: State regions, Plans, Physicians, Illinois, *Health care utilization, Health care services, Health care facilities, Health care delivery, *Emergency medical services.

Problems arising from the use of emergency departments (EDs) as a physician's office or ambulatory care facility are discussed in the context of Chicago's Cook County Hospital, and Cook County Hospital procedures are compared with activities of other county hospitals. The main impetus for the increasing use of EDs as the point of entry into the health care system has been failure in other aspects of the system such as a lack of physicians and clinic facilities. A 1965 utilization study of patients in 22 Michigan hospitals indicated that 43 percent of all patients attempted to call a physician before using an ED, 35 percent actually contacted a physician, and 23 percent did not call a physician but went to the hospital because they believed their physician was not available at the time care was needed. It is felt that county hospitals continue to bear the brunt of the emergency room deluge but that private hospitals are also affected. The response of Cook County Hospital is described as a lesson to private hospitals which involves tagging those patients who are not real emergencies and separating them from persons needing emergency care. Nonemergency patients can then be seen by a physician in the order of arrival. Nurses in the ED of Cook County Hospital have power to admit patients to the hospital, and routine medical staffing is by residents on rotation. One of the worst problems is considered to be the dumping of real emergency patients by other hospitals.

HRP-0007730/5GA Not available NTIS
Harvard Univ., Cambridge, Mass.
Three-Stage Manpower Planning and Scheduling Model: A Service-Sector Example.
William J. Abernathy, Nicholas Baloff, John C. Hershey, and Sten Wandel. 12 Oct 72, 19p
Pub. in Operations Research v21 n3 p693-711 May-Jun 73.

Descriptors: System analysis, Supplies, Reserves, *Nurses, Methodology, Medical personnel, Measurement, Mathematical models, Job analysis, Inventories, Health resources, Health manpower, Health care utilization, Data processing, Data analysis.

A staff planning and scheduling model is presented which has specific application in the nurse staffing process in acute hospitals and more general application in many other service organizations in which demand and production characteristics are similar. Aggregate planning models that have been developed for goods - producing organizations are not considered to be appropriate for many types of service organizations. In the staffing planning and scheduling model, the process for staffing services is divided into three decision levels: (1) policy decisions, including operating procedures for service centers and for the staff control process itself; (2) staff planning including hiring, discharge, training, and reallocation decisions; and (3) short-term scheduling of available staff within constraints determined by the previous two decision levels. These three planning levels are used as decomposition stages in developing a general staffing model. Planning and scheduling stages are formulated as a stochastic programming problem, an iterative solution procedure is suggested using random loss functions, and a noniterative solution procedure is developed for a chance - constrained formulation which considers alternative operating procedures and service criteria and permits including statistically dependent demands. The discussion includes an example application of the manpower planning and scheduling model and illustrations of its potential uses in the nurse staffing process.

HRP-0007752/9GA Not available NTIS
Brookings Institution, Washington, D.C.
Doctor Shortage: An Economic Diagnosis.
Rashi Fein. 1972, 206p
Available from the Brookings Institution, 1775 Massachusetts Ave. N.W., Washington, D.C. 20036, $2.95.

Descriptors: United States, Supplies, Reserves, *Physicians, Methodology, Medical personnel, Inventories, Health resources, Health occupations, Health manpower, *Health economics, Health care, Health care requirements, Forecasting, Economics, Economic theory.

An economic viewpoint on the doctor shortage is presented, based on a study sponsored by the Brookings Institution in Washington, D.C. Future physician shortages are estimated and causes and criteria related to that shortage are discussed. The future demand for physician services is examined in terms of the impact of demographic and socioeconomic and other changes. Physician supply is discussed, with emphasis on supply trends. Productivity and organization are also discussed concerning the organization of medical care and new types of personnel. Physician demand and supply in 1975 are summarized and policy implications for the future are noted. Three appendices provide detailed information on physician demand projections, physician visits from 1959 through 1964, and child health services.

HRP-0007760/2GA PC$5.50
Michigan Univ., Ann Arbor. School of Public Health.
Econometric Model of the Medical Care Sector: A Description of the Model and Illustrative Applications.
Paul J. Feldstein, and Sander Kelman. 1971, 103p
Grant PHS-HS-00041

Descriptors: System analysis, Methodology, Medical personnel, Measurement, Mathematical models, Health manpower, *Health care, Health care requirements, Economics, Economic studies, Data processing, Data analysis.

An econometric model of the medical care sector is described, parameters and equations involved in the development of the model are explained, and the usefulness of the model is demonstrated through a series of applications. The model has basically three levels: (1) an identity expressing the value of medical care rendered as the sum of the values of medical care provided in each of five institutional settings (hospitals, nursing homes, outpatient clinics, physicians' offices, and the patient's home), and a Laspeyres price index based on this identity; (2) analysis of the supply and demand for the services of institutions; and (3) the resulting derived demand for and supplies of health manpower. The development of each of the levels and of the numerical expression of the model is described in detail. The use of the econometric model for policy analysis is illustrated as follows: (1) a demand - side policy analysis of national health insurance programs, providing a view of how policymakers could increase the public's utilization of medical care through a demand - side subsidy; and (2) a supply - side subsidy designed to increase utilization of care by increasing the supply of providers. Supporting data and equations are included. Portions of this document are not fully legible.

HRP-0007766/9GA Not available NTIS
Sonnenschein, Carlin, Nath and Rosenthal, Chicago, Ill.
Nurse as a Professional and as a Unionist.
Richard L. Epstein, and K. Bruce Stickler. 1975, 6p
Pub. in Hospitals, Jnl. of the American Hospital Association v50 n2 p44-48, 108 16 Jan 76.

Descriptors: Professional organizations, Private organizations, Private institutions, *Nurses, Nonprofit, Legislation, Law(Jurisprudence), Health resources, Health related organizations, Health occupations, Health manpower, Health care delivery systems, Employment.

The response of the American Nurses' Association (ANA) to demands placed upon it by new legal developments and new goals is examined. Developments which cause special problems for nurses are essentially three-fold: (1) relationship among nurses, their hospital employers, and regional, State, and national nurses' associations; (2) imposition of a new set of rules to govern the employment relationship; and (3) unionization of nurses. The ANA is a professional association concerned with various aspects of health care, including the education and training of nurses and the collection, organization, and dissemination of information relating to the improvement of health care delivery. The ANA is also a labor organization which represents employees with respect to hours, wages, and working conditions. The dilemma of professionalism versus unionization is discussed. It is recommended that ANA solve this dilemma by realigning its internal structure to make absolute and formally separate its educational function and union identity. It is noted that nurses need to have resources for continuing education, uncomplicated by union organizational matters, but also need to promote their union aspirations.

HRP-0007768/5GA Not available NTIS
Michigan Univ., Ann Arbor.
Mathematical Programming Model for Scheduling Nursing Personnel in a Hospital.
D. Michael Warner, and Juan Prawda. Mar 72, 12p
Pub. in Management Science v19 n4 p411-422 Dec 72.

Descriptors: System analysis, *Nurses, Methodology, Mathematical models, Health manpower, Health care, Health care utilization, Data processing, Data analysis.

A mathematical programming model for scheduling nursing personnel in hospitals is described. The nursing personnel scheduling problem is defined as the identification of that staffing pattern which specifies the number of nursing personnel within each skill class to be scheduled among wards and nursing shifts of a scheduling period; satisfies total nursing personnel capacity, integral assignment, and other relevant constraints; and minimizes a 'shortage cost' of nursing care services provided for the scheduling period. The scheduling problem is posed as a mixed-integer quadratic programming problem which is decomposed by a primal resource - directive approach into a multiple - choice programming master problem with quadratic programming subproblems. The point of departure for the present model from previous work on the scheduling of nursing personnel is its emphasis on maintaining the integral and capacity constraints of the problem. The demand for nursing care services is assumed to be known, becoming an exogenous variable to the scheduling model. The model was tested on six medical-surgical-orthopedic wards of a 600-bed acute general hospital in Louisiana. Initial results suggest that a linear programming formulation, with a post - optimal feasibility search scheme, may be substituted for the multiple - choice master problem. Supporting test data and mathematical formulations are included.

HRP-0007795/8GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Coronary Care Unit Design, Staffing, and Operating Policies.
Helen E. Blumen. Mar 75, 17p
Available from the Rand Corp., 1700 Main Street, Santa Monica, Calif. 90406, $1.50.

Descriptors: Therapy, Specialists, Research, Registered nurses, Patients, Nurses, Inpatients, *Health resources, Health occupations, Health manpower, Health care technology, Health care services, *Health care facilities, Health care delivery, California, Acute care.

The equipment, staffing, and operating policies of 96 coronary care units (CCUs) in California that participated in a California Committee on Regional Medical Programs study of CCU effectiveness are described. More than half of the CCUs studied are specially designed separate facilities for the monitoring and care of coronary patients. These have elaborate equipment for patient monitoring and resuscitation, accounting in part for the fact that the average daily charge for care in a CCU is over twice that for care in a semiprivate room. Nursing staffing of CCUs is predominantly by registered nurses. On weekends and at night, the nursing staff level is lower than it is on a weekday during the day shift. Three-fourths of the CCUs maintain their own inservice training programs. In 64 percent, a physician is always on call, but in only 8 percent is there always a physician on duty in the CCU. Over 85 percent have a written policy governing patient selection for CCU admission. The physician responsible for admission, discharge, and medical care in the CCU is usually the patient's private physician, although the CCU director and house staff have this responsibility in some units. Delegation to the nursing staff of responsibility for administering drugs and performing procedures on an emergency basis has occurred in most CCUs. Because of the nature of myocardial infarction, most CCUs do not specify minimum lengths of stay or standard lengths of stay for serious conditions that can complicate myocardial infarction. Supporting tabular data are included.

HRP-0007832/9GA PC$9.25/MF$3.00
National Heart and Lung Inst., Bethesda, Md.
Proceedings of the National Heart and Lung Institute Working Conference on Health Behavior.
Stephen M. Weiss. 1975, 298p DHEW/NIH-76/868

Descriptors: Safety engineering, *Preventive medicine, Methodology, Injuries, *Health care technology, Diseases, Ailments.

The proceedings of a five-day working conference sponsored by the National Heart and Lung Institute in May 1975 are reported. Objectives of the conference were: (1) to critically review the specific behavioral and educational concerns associated with prevention and control of heart, lung, and blood disorders; (2) to recommend approaches for resolving these problems, using state of the art technology; and (3) to suggest directions for future research in areas where knowledge is lacking or ambiguous. Given the conference emphasis on behavioral and social science, the participant balance favored these groups, with a minority of biomedical participants serving as resource persons. The conference format was oriented toward discussion rather than presentation, and extensive preconference materials were provided to participants. Thematic sessions treated the following areas of concern: life style development versus modification; individual responsibility for health maintenance; psychosocial determinants of health and illness; psychosocial sequelae of illness; ethical concerns regarding health behavior; compliance; recruitment; and coping. Tasks groups worked in the following areas: atherosclerosis, blood donor recruitment, cardiac rehabilitation, chronic pulmonary disease, and hypertension. In addition, evening 'dialogues' on biofeedback, smoking, and gaming as a planning tool were held. Session summaries and task group reports are included in the report, and preconference materials are appended. Photographs are included.

HRP-0007961/6GA Not available NTIS
New York City Dept. of Health.
Policing Publicly Funded Health Care for Poor Quality, Overutilization and Fraud -- The New York City Medicaid Experience.
Lowell Eliezer Bellin, and Florence Kavaler. 1970, 10p
Pub. in the American Jnl. of Public Health v60 n5 p811-20 May 70.

Descriptors: State regions, Standards, Reviewing, Quality assurance, Projects, New York, Methodology, Measurement, Health care, Health care delivery, Evaluation, Criteria, Comments, Assessments, Appeals(Law).

Arguments are presented for a government audit program of publicly - funded health services provided by medical and other health practitioners. An overview of the objections and rebuttals with respect to auditing is provided, and the respective positions of the New York City Health Department (pro audit) and the American Medical Association (opposed to governmental audit) are noted. The present auditing staff of the New York City Health Department is described, and the savings effected by auditing are documented. Some abuses of the Medicaid program are discussed, such as overutilization, fraud, and poor quality care, as well as patient abuse. Informal hearing and formal hearings arranged to examine Medicaid abuse are described, and it is suggested that informal hearings are preferable. Recent legal rulings involving the New York City Health Department are discussed, in the context of Health Department authority and responsibility in the field of tax - supported private health care.

HRP-0007971/5GA Not available NTIS
Princeton Univ., N.J.
Toward a Rational Community Health Care System: The Hunterdon Model.
Anne R. Somers. 1973, 9p
Pub. in Hospital Progress v54 n4 p46-54 Apr 73.

Descriptors: State regions, State government, Research, Plans, Patients, New Jersey, National government, Local government, Inpatients, Health resources, Health related organizations, Health related individuals, Health care utilization, Health care facilities, Government agencies, Ambulatory health care.

The operation of health care systems as Federal - State utilities or franchises is investigated. The ultimate goal in health systems development is a health care system which will provide every individual with access to first - rate comprehensive health care, as needed and at reasonable cost, regardless of where he lives or his socioeconomic status. Three basic categories of care are interdependent: primary, secondary, and tertiary care. Every provider of health care must play the role for which it is best equipped and must be prepared to relinquish some autonomy to other providers. This is considered to be the inevitable result of specialization. The concept of the community hospital as the core of a rational health care system is advocated, based on a model example involving the Hunterdon Medical Center in Flemington, New Jersey. Characteristics of the hospital are described, along with its organization. Hunterdon's emphasis on ambulatory care has been beneficial in terms of reduced hospital utilization. The feasibility of health care through Federal - State public utilities or a franchise system is examined and guidelines for such a strategy are presented. It is recommended that States take the lead in helping to establish a national network of State hospital and health care regulatory programs, a network that will inevitably involve Federal support and guidelines.

HRP-0007972/3GA Not available NTIS
Five Approaches for Assessing the Quality of Care.
Willy DeGeyndt. 1970, 22p
Pub. in Hospital Administration v15 n1 p21-42 1970.

Descriptors: Standards, Reviewing, Quality assurance, Methodology, Measurement, *Health care, Health care delivery, Evaluation, Criteria, Assessments.

Five basic methods to assess the quality of health care are outlined. The methods involve the assessment of quality by evaluating the content, process, structure, outcome, and impact of health care. Health care is defined to include comprehensiveness, completeness, and continuity. Two of the above approaches are examined in detail (content and impact). Concern with the content of care reflects upon the great variability in the quality of practitioners produced by medical schools, over and beyond normal individual variation. This is a mechanical and static approach which serves two purposes: educational (self-appraisal and self-discipline), and quality control as it exists in industry to keep production within predetermined boundaries or within an approved range of standard deviations. The impact approach centers on the impact of health care and the health services system on the life of an individual and on the population in general. It is considered to be a dynamic approach that is sensitive to changes in the art and science of medicine and to social and cultural developments. It answers two crucial questions: (1) does health care benefit a patient; and (2) does it benefit society. It should be noted that in some cases what is best for the patient may not be best for society.

HRP-0007976/4GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Demand for Health Insurance: A Theoretical and Empirical Investigation.
Charles E. Phelps. Jul 73, 110p R-1054-OEO
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $7.00.

Descriptors: System analysis, Surveys, Prepaid health care, Methodology, Measurement, Mathematical models, Health resources, *Health insurance, Health care, Health care requirements, Health care facilities, Health care delivery, Financing, Data processing, Data analysis, Data acquisition.

A theory of demand for reimbursement insurance that takes into consideration two aspects of health insurance (payment proportional to amount of care purchased, and loss sustained may not be financial, but can be loss from the 'stock' of health) is developed. The empirical section of the report analyzes specific characteristics of insurance policies held by individual families. The data are from a pre-Medicare-Medicaid period, so the effect of those governmental programs on demand for insurance is not directly estimated. A model is presented that suggests the appropriate variables to include in a demand curve for insurance, and the model gives some insights into expected signs. Additionally, it shows how demand for insurance and demand for medical care interact, establishing that a simultaneous equation system would be necessary to estimate demand for medical care and demand for health insurance. Two estimates of the demand for reimbursement insurance are described; one is a time - series study where average insurance coverage rates for medical care are the dependent variable, and, in the other, actual insurance contracts of individual families are investigated in a micro - cross section study. Both estimates rely on the theory developed in the model specification, and both rely upon the existence of the demand curves for insurance that are implicit in the model. A bibliography is provided and appendices present supplementary data.

HRP-0007978/0GA Not available NTIS
New York City Health Services Administration.
Planning Public Expenditures on Mental Health Service Delivery.
Frank A. Sloan. Feb 71, 129p RM-6339-NYC
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $7.00.

Descriptors: Quality assurance, Methodology, *Mental health care, Measurement, Health care, Health care services, *Health care costs, Data processing, Data analysis, Cost effectiveness, Benefit cost analysis.

Several aspects of the delivery of mental health services are examined, with emphasis on data obtained from surveys of two community mental health centers. Among the themes emerging from the study are: delivery of mental health services may be improved by refining existing market mechanisms; meaningful benefit-cost analysis is a distant prospect, as necessary data are not yet available; an efficiency evaluation of ways to increase the quantity of services provided for a given cost is possible and could prove useful to planners. Among major survey findings are: (1) input substitution is widely practiced, with persons of widely differing educational backgrounds performing the same functions; (2) scale economies in producing mental health services are unlikely, there being evidence that 'diseconomies' of scale exist; (3) inefficiencies related to staff morale and staff incentives, organizational factors, and record keeping systems create substantially greater costs; (4) significant changes in personnel - patient ratios are needed to effect discernible changes in direct patient care; and (5) average per - patient costs in some community mental health clinics are higher than in private psychiatric practice. Supporting data, information on methods of analysis, and a bibliography are included.

HRP-0007984/8GA Not available NTIS
Office of Economic Opportunity, Washington, D.C.
Issues in the Analysis and Design of the Experimental Portion of the Health Insurance Study.
Joseph P. Newhouse. Jun 74, 27p R-1484-OEO
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $3.00.

Descriptors: System analysis, Statistical analysis, Methodology, Mathematical models, Health resources, Health economics, Health care, Health care facilities, Health care delivery, Financing, Economics, Economic studies, Data processing, Data analysis.

Certain technical problems are presented which were encountered in the design of an experiment to test the effect of alternative health insurance plans. Two issues concerning data analysis in the experimental design are identified, along with four issues in the statistical design of the study. The first analytical problem concerns the specified coinsurance rate faced by consumers; the proposed treatment for this problem involves the analysis of episodes rather than annual expenditures. The second analytical issue concerns the treatment of supplementary insurance and determination of the dependent variable. Problems in statistical design are as follows: (1) how to determine the number of families to be allocated to any particular plan; (2) how to select families who will be included in an experiment; (3) how will families be allocated to an insurance plan; and (4) how to choose sites. Solutions to each statistical design problem are discussed.

HRP-0007988/9GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Technological Opportunities for the Delivery of Health Care.
E. C. DeLand, and Bruce Waxman. Oct 68, 16p
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $1.50.

Descriptors: Technical assistance, Strategy, Research and development, Projects, National government, Management methods, Innovations, *Health resources, Health related organizations, Health planning agencies, Health care technology, *Health care delivery, Government agencies.

Programs and plans of the National Center for Health Services Research and Development as of fall 1968 are examined, with emphasis on development of computer technology and its applications in the health field. The Center supports, promotes, and stimulates health services research, development, and demonstration through grants and contracts. The objectives of research include the following: (1) improving availability of services; (2) assisting health professions to improve their capabilities for assessing the quality of services; (3) investigating costs of methods of providing and financing health services; (4) experimenting with new architectural designs, site locations, plans, and methods of construction; (5) increasing efficiency through new ways of training and utilizing health personnel; (6) applying and refining computer technology; (7) accelerating applications of new techniques for prevention, diagnosis, treatment, and control of diseases and disabilities; (8) designing and initially operating experimental health services systems in urban and rural areas; (9) making multidisciplinary analyses of the organization and functioning of all components of the health services system; (10) increasing academic resources for research and development personnel; and (11) establishing and operating a health services data system. Among computer technology applications discussed are: patient monitoring, permanent automated patient clinical records, automated pharmacy and current hospital records, clinical chemistry systems, multiphasic health screening, patient interviews, and pattern recognition.

HRP-0007995/4GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Supply Responses of Young Physicians: An Analysis of Physicians in Residency Programs.
Frank A. Sloan. Mar 73, 94p R-1131-OEO
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif, 90406, $5.00.

Descriptors: System analysis, Statistical distributions, *Physicians, Methodology, Mathematical models, *Health resources, Health occupations, Health manpower, Health care, Distribution, Demography, Data processing, Data analysis, Communities.

An analysis of the number of hours physicians in residency programs devote to patient care and choice of practice mode by these resident physicians is provided based on three surveys conducted by the 'Hospital Physician.' It is suggested that factors underlying a resident's decision to earn extra income in a second job (moonlighting) are the same as those influencing decisions on work hours in other fields, i.e., wage rate, income from other sources, and demographic considerations. The amount of time spent in moonlighting varies with hospital type, year of residency, and specialty. A dramatic increase in stipends paid to residents since the mid-1960s has had a negative effect on moonlighting. Borrowing funds constitutes an alternative for financing medical education. A single equation model is presented which uses the standard framework of utility theory for analyzing the resident's choice between moonlighting and leisure. The primary focus of the model is on labor supply responses to changes in financial variables, the wage offered moonlighters, and income. The model yields predictions based on alternative wage-income combinations. Household decision-making in the context of decision to moonlight is examined according to the following variables: current consumption, leisure of the resident, leisure of the resident's spouse, and current dissaving. Analysis of resident physician practice mode decisions reveals that this decision is made usually during residency. Expected income appears to have a substantial effect on practice mode choice, as does regularity of hours. An explanation of the variables used in analysis, illustrative data, and a bibliography are included.

HRP-0007996/2GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Coinsurance and the Demand for Medical Services.
Charles E. Phelps, and Joseph P. Newhouse.
Oct 74, 68p R-964-1-OEO/NC
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $5.00.

Descriptors: System analysis, Methodology, *Medical services, Mathematical models, Health resources, Health economics, Health care, Health care requirements, Health care facilities, Health care delivery, Financing, Economics, Data processing, Data analysis.

A model for medical services when reimbursement insurance is present and when time costs are involved in purchasing medical care is developed, based on a formal model of utility maximization. A major theoretical finding is that responsiveness to changes in insurance coverage diminishes as the cost of time becomes a relatively more important (and money price a relatively less important) proportion of total costs for medical services. It is also shown that, under plausible (and weak) conditions, the observed responsiveness of demand for medical care either to money price changes or to insurance coverage changes approaches zero as insurance coverage becomes complete. The report treats the problem of coinsurance empirically as well as theoretically. A number of data sources are used to estimate elasticities of demand for medical care services, and the results are compared with those of three other studies of the same problem. The present study estimates that approximately 8 to 17 percent more services would be demanded at a zero coinsurance rate than at a 25 percent rate. It is noted that, while the zero to 25 percent range of coinsurance is relevant in assessing differences among many proposed universal health insurance plans, these estimates may not be appropriate in assessing the effects of a shift from no insurance to complete or nearly complete coverage. A pattern of low elasticity of demand for hospital services and ancillary services, a higher elasticity for office visits, and the highest for home visits is in accord with the underlying model developed. It is noted that the study findings add to the body of evidence indicating that greater coinsurance implies less use of services, with the amount of reduction varying by type of service. Supporting data and calculations are included.

HRP-0008000/2GA Not available NTIS
Rand Corp., Santa Monica, Calif.
Preventive Medicine Policies.
J. J. McCall. May 69, 11p
Available from the Rand Corp., 1700 Main St., Santa Monica, Calif. 90406, $1.50.

Descriptors: System analysis, Statistical analysis, *Preventive medicine, Methodology, Measurement, Mathematical models, Health care, Health care utilization, Health care technology, *Dental services, Data processing, Data analysis, Ailments.

A methodology for extending research on physical capital to human capital is explained, where scheduling techniques developed for

equipment are used to evaluate preventive dental and medical policies for humans. The scheduling of medical and dental check-ups is considered to be an important problem confronting government agencies. In addition, these check-ups policies should be of interest to individuals who must decide for themselves and their family on the necessary frequency of medical and dental inspections. One difficulty in transferring policies developed for equipment to humans lies in the assignment of economic value to a human. The study circumvents this difficulty by treating only the scheduling of dental examinations. Some of the criteria investigated include time between dental visits, occurrence of a toothache, and expected cost per unit time. Calculations are provided for various criteria. It is noted that the simple dental model presented can be generalized so that it might be applicable to other more serious diseases like cancer.

HRP-0008012/7GA Not available NTIS
Montefiore Hospital, Bronx, N.Y.
Making Health Teams Work.
Harold Wise, Richard Beckhard, Irwin Rubin, and Aileen L. Kyte. 1974, 184p
Available from the Ballinger Publishing Co., 17 Dunster St., Harvard Sq., Cambridge, Mass. 02138, $13.50.

Descriptors: *Urban health services, Urban areas, State regions, Organization theory, New York, Health resources, Health related organizations, Health occupations, Health manpower, Health manpower education, Health education, Health care utilization, Health care services.

The development of a team approach to family - centered health care at the Dr. Martin Luther King, Jr. Health Center, located in the Morrisania section of the South Bronx, New York City, is documented. The early years of the Center are described, including how the health teams evolved from a disease - oriented medical model to a client - centered model that makes use of an interdisciplinary team with medical, nursing, psychological, dental, social, legal, educational, and community development skills to provide comprehensive care on the basis of need as defined by the families served. The organizational development of two of the Center's eight primary care health teams is described, as are tasks that the teams undertook to increase their understanding of their own dynamics, and the action - research model used by consultants in planning and carrying out the first pilot intervention. The design of the administrative structure to support the work of the teams is described. Roles, decision-making, power distribution, and staff education are discussed, and issues are raised with implications for providers of health services in hospitals and ambulatory centers as well as for those concerned with health manpower education. The Center's efforts to build an internal organizational development capacity are assessed. The future of health team development is considered, including descriptions of ongoing work at the Institute for Health Team Development at Montefiore Hospital and at Massachusetts Institute of Technology concerning educational strategies for interdisciplinary health teams development. A bibliography and an index are included.

HRP-0008025/9GA Not available NTIS
Yale Univ., New Haven, Conn. Dept. of Epidemiology and Public Health.
Neighborhood Health Centers.
1969, 81p
Pub. in Medical Care v8 n2 Mar-Apr 70.

Descriptors: *Urban health services, Urban areas, United States, State regions, Projects, Ohio, Medical services, Kansas, Health care services, Health care delivery.

Articles pertaining to Office of Economic Opportunity (OEO) neighborhood health centers (NHCs) are presented in the March-April 1970 issue of Medical Care, an international journal sponsored by the Medical Care Section of the American Public Health Association. Most articles in the issue are devoted to various aspects of NHCs, including goals and potentials of NHCs, social scientist's view of the NHC as a new social institution, sociomedical view of NHCs, economist's view of the NHC as a new social institution, political scientist's view of the NHC as a new social institution, commentary on the social scientist's views, evaluating quality of medical care in the NHC program of OEO, measuring the urban poor's use of physician services in response to illness episodes, and the Kansas Blue Cross/Blue Shield outpatient benefits experiment. Also included are communications on capitation prepayment without formal group practice and the stability of the medical group in a new prepaid medical care program in Cleveland, Ohio.

HRP-0008049/9GA Not available NTIS
Harvard School of Public Health, Boston, Mass.
Cost and Efficiency in the Production of Hospital Services.
Ralph E. Berry. 1974, 23p
Grant SRS-10-56002
Pub. in the Milbank Memorial Fund Quarterly v52 n3 p291-313 1974.

Descriptors: United States, Quality assurance, Patients, Methodology, Measurement, Inpatients, Health care, *Health care costs, Data processing, Data processing systems, Data analysis, Cost effectiveness, Benefit cost analysis, Acute care.

General findings of an investigation undertaken to identify and measure the effects of various factors on the cost and efficiency of the short-term general hospital system in the United States are reported. The analyses involved data on approximately 6,000 hospitals for the years 1965, 1966, and 1967, and employed a model that expressed hospital cost as a function of the level of output, the quality of services provided, the scope of services provided, factor prices, and relative efficiency. The statistical analysis provided the following insights concerning factors influencing hospital costs: (1) hospital services are produced subject to economies of scale, but absolute magnitudes are insignificant; (2) on the basis of limited data available, it may be concluded that quality care does affect costs; (3) medical education is a significant factor affecting hospital costs; and (4) product mix has a significant impact on costs. Three separate analyses are summarized specific to the product mix difference aspect of the production of hospital services, its effect on hospital cost analysis, and techniques that can be employed to account for product mix. Another analysis, concerning the characteristics of high cost and low cost hospitals, is also summarized. Low cost hospitals were found to be more likely to have administrators with medical qualifications, to be located in southern States, to have a higher ratio of personnel expense to total expense, to have relatively high occupancy rates, and to tend to group around the middle of the bed-size range. Supporting data are included.

HRP-0008057/2GA Not available NTIS
Mobile Units: A Solution to the Rural Health Problem.
Thomas S. Bodenheimer. 1968, 11p
Pub. in Medical Care v7 n2 p144-154 Mar-Apr 69.

Descriptors: Statistical distributions, *Rural health services, Rural areas, Health resources, Health care, *Health care services, Demography, Communities.

The use of mobile health units to solve rural health care problems resulting from extremely low densities of health professionals and large distances between patients and services is discussed. It is noted that the underdeveloped countries have had considerable experience with different types of mobile units, and that certain principles useful in choosing between stationary and mobile facilities for specific situations may be derived from that experience. The first consideration is the geographic - demographic layout. Second is the type of health service desired, mobile units being more applicable to periodic health services requiring simple facilities than to delivery of comprehensive care. The third factor in choosing between stationary and mobile systems is the determination of the cost benefits of each. It is concluded that, while mobile units have great potential for serving rural areas, especially in certain aspects of preventive medicine and emergency care, the mobile system should not be implemented without thoughtful analysis. It is further noted that often stationary medical services supported by good transportation systems can accomplish far more, albeit in a less dramatic fashion, than mobile units.

HRP-0008078/8GA PC$6.75/MF$3.00
Comprehensive Health Planning Council of Whatcom, Skagit, Island, and San Juan Counties, Mount Vernon, Wash.
Hospital Development Guide. Revised Edition.
16 Dec 75, 159p

Descriptors: Washington(State), Systems, State regions, Plans, Patients, Methodology, Inpatients, Health planning, *Health care services, Health care delivery, Health care delivery systems, Development, Data acquisition.

A Hospital Services Development Guide is presented that was prepared by the Comprehensive Health Planning Council as the second component of an overall health facilities and services plan. The guide was developed over a two-year period, based on research and planning efforts in four counties in the State of Washington: Whatcom, Skagit, Island, and San Juan. Initial planning efforts in the area of hospital services produced a lengthy inventory of various aspects associated with hospital operation. Problem areas were then identified for indepth study and included three broad categories: (1) administration (use of State occupancy standards in project review and consumer participation in hospital policy development); (2) resources (third-party reimbursement problems); and (3) service delivery (development of mechanisms for quality assurance and problem services which involved health education, hospital-based alcoholism services, obstetrics, and hospital-based skilled nursing facilities). Recommendations on each of these categories are presented. Appendices contain details of a hospital bed need study for 1974 and 1980 that was conducted in the four Washington counties by the Comprehensive Health Planning Council, results of an inventory of hospital services and facilities, and 1122 / certificate of need standards and criteria. Portions of this document are not fully legible.

HRP-0008310/5GA Not available NTIS
National Library of Medicine, Bethesda, Md.
Health Maintenance Organizations.
Charlotte Kenton. 1973, 13p
Available from the Reference Services Division, National Library of Medicine, 8600 Rockville Pike, Bethesda, Md. 20014, single copy free.

Descriptors: Sources, Private organizations, Private institutions, Methodology, Health resources, Health related organizations, *Health maintenance organizations, Health care, Documents.

Journal articles concerning prepaid group health services in the United States are listed alphabetically by author in a bibliography produced by the National Library of Medicine Medical Literature Analysis and Retrieval System (MEDLAR). Each citation is accompanied by MEDLAR descriptors. The listing includes 229 citations of journal articles published from January 1969 through January 1973.

HRP-0008515/9GA Not available NTIS
Miami Univ., Fla. School of Medicine.
Telemetry-Medical Command in Coronary and Other Mobile Emergency Care Systems.
Eugene L. Nagel, Jim C. Hirschman, Sidney R. Nussenfeld, Edward Lundblad, and David Rankin. 1970, 7p
Grant PHS-GM-01835, Contract FH-11-7198
Pub. in the Jnl. of the American Medical Association v214 n2 p332-338 12 Oct 70.

Descriptors: State regions, Plans, Health resources, Health occupations, Health manpower, Health care services, Health care delivery, Florida, *Emergency medical services, Allied health personnel.

A telemetry - medical command system is described which is based on cooperation between in-hospital physicians and mobile paramedical rescue crews. Miami, Florida's Fire Department Rescue Service uses three permanent rescue vehicles manned by career firemen who have received paramedical training. A radio frequency assigned to local government usage is shared for telemetry transmissions, and frequency modulation is accomplished with specially designed, commercially available assemblies. An existing two-way voice communication network is basic to this command system. The communication pathway contains the following elements: portable transceiver - telemetry package, fire rescue communications, dedicated landline from communications headquarters to hospital, and physician - manned receiving area in the hospital. A study of 146 victims remotely monitored over a two-year period in Miami indicated a response time by the rescue vehicle of less than four minutes in 80 percent of cases. Besides having a fast response rate, the system entails lower costs through the use of paramedical rather than medical personnel and permits high utilization through rapid communication.

HRP-0008536/5GA PC$3.50/MF$3.00
Treasure Valley Comprehensive Health Planning Agency, Boise, Idaho.
Work Program: Fiscal Year 1973-1974.
Jul 73, 21p

Descriptors: Strategy, State regions, Plans, Personnel management, Methodology, Management methods, Implementation, Idaho, Health related organizations, Health planning, Health planning agencies, *Health care delivery, Evaluation, Annual, Agencies.

Core functions and support activities for fiscal year 1973-1974 are delineated in the work program of the Treasure Valley Comprehensive Health Planning Agency, Boise, Idaho. The work program contains projected benchmarks or progress elements that identify levels of accomplishment by stated time periods; it provides an objective and methodical basis on which personnel may be assigned and assessed, timetables checked, and achievements weighed. The core functions for which goals and objectives are identified include: plan implementation, analysis, and revision; problem identification, analysis, and implementation (special studies); policy recommendations; and project review. Support functions include agency management, community relations, planning coordination, and data maintenance. For each function, goals, objectives, methods of reaching objectives, and basis of evaluation are set forth.

HRP-0008813/8GA Not available NTIS
Home Health Services and Health Insurance.
Brahna Trager. 1970, 10p
Pub. in Medical Care v9 n1 p89-98 Jan-Feb 71.

Descriptors: Reviewing, Research, Regulations, Prepaid health care, Methodology, Health resources, *Health insurance, Health care, Health care delivery, Health care delivery systems, Financing, Feasibility studies, Evaluation, Comments, Assessments.

Regulatory factors impeding the development and utilization of home health services, an alternative to institutionalization for eligible recipients of Medicare benefits, are discussed. Such factors include the emphasis of Medicare regulations upon direct nursing services and personal care as requirements for entry into reimbursed home health service plans, problems of interpretation resulting from the complexity of insurance regulations as they apply to the delivery of services by home health agencies, and difficulties that arise from a series of requirements for eligibility that do not apply when a physician considers a patient to be in need of hospitalization. Further difficulties exist, it is noted, in States which have implemented Public Assistance and Medically Needy sections of the Medicare program. Approaches are suggested for removing these and other regulatory barriers to assigning home health care a valid position in the range of services provided to older patients and to the medically needy. Such approaches would take into consideration the fact that chronic disease and the process of aging often impose long-term rather than or in addition to acute needs. Benefits to be derived from the strenghtening of home health services as a flexible component of the health care system are discussed, and examples of contributions from home health agencies in the United States and in other countries are cited.

HRP-0008818/7GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Increasing Dental Output: A Review of Productivity.
Paul J. Feldstein. Sep 73, 26p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: United States, Productivity, Physician extenders, Physician assistants, Methodology, Medical personnel, Measurement, Health manpower, Health care, Health care utilization, Health care services, *Dentists, *Dental services.

Following an introductory review of the supply of dental manpower and the production of dental services in the United States as of the early 1970s, labor - intensive approaches to increasing dental productivity are discussed. Measures of output used in the past to describe increases in dental productivity, such as dental visits, consumer expenditures on dental care, and gross incomes of dentists, are examined. Studies indicative of the potential increases in dental productivity obtainable through use of expanded function auxiliaries are cited, and relevant experiences of foreign countries in utilization of expanded function dental auxiliaries are described. Restraints which have prevented the full utilization of expanded function dental personnel in the United States are identified, including State legislation limiting delegation of expanded functions to auxiliaries, certain activities of State dental examining (licensing) boards, and practitioner attitudes. Areas of need for future research on dental productivity are suggested, and policy implications regarding increased dental productivity are discussed.

HRP-0008824/5GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Natural History of the Development of the Physician's Assistant in California.
Donna Ver Steeg. May 74, 34p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Regulations, Quality assurance, Physician extenders, *Physician assistants, Methodology, Medical personnel, Licenses, Health occupations, Health manpower, Health care, Health care delivery systems, Employment, Credentials, Certification, *California.

The history of the development of physician extender regulatory protocol in California is traced, and conclusions are drawn concerning the problems encountered in the California process. It is observed that pressures on the study committee during its early efforts to develop regulations for physician assistants (PAs) were related to a conflict between the immediacy of the need for regulations and the desire to consider long-term implications. The process of developing regulations for PAs was made difficult by the relative isolation in which some of the decision-making took place. The lack of an organized attempt to determine whether a need for PAs existed in the State is noted. The study committee also observed a 'degree of ignorance' among both physicians and nurses concerning the nature of their practice acts and the rights and responsibilities conferred upon them. The unique political circumstances under which the California PA regulation issue was debated are noted. Two general strengths of the California process are identified: (1) the early involvement of a broad spectrum of professional groups and governmental agencies, and (2) the use of public hearings. A third strength is identified in the use of the same advisory group to study both the PA and the nurse practitioner. Two notable weaknesses of the California process also are cited: (1) problems involving the relationship between the advisory study committee and the Board of Medical Examiners, and (2) hindrance by previous patterns of decision-making. It is suggested that a committee assigned the responsibility for developing regulatory protocol for physician extenders needs a statutory base with power to allocate funds, hire staff, and initiate studies.

HRP-0008825/2GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
More Family Physicians or More Primary Care: An Analysis of the Family Practice Act (S. 3418).
George E. Wright. Nov 73, 33p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: United States, *Physicians, National government, Legislation, Law(Jurisprudence), Health resources, Health occupations, Health manpower, *Health manpower education, Health education, Health care delivery systems, Financing.

Based on an analysis of the status of the primary care physician in the United States as of 1971 and a discussion of rationale frequently offered by proponents of family practice, a critique of the Family Practice Act of 1970 is presented. The law provided a five-year authorization, through fiscal year 1973, of funds for grants to medical schools and hospitals in furtherance of programs in family practice. The critique raises

doubts concerning the viability of the notion that family practice specialty is a trend of the future. Questions are raised concerning the following assumptions: (1) that a sufficient number of medical students want to enter the field of family practice; (2) that effective demand to employ and actually pay new specialists in family practice at going income levels exists; and (3) that jobs will be sufficiently attractive to hold graduates in long-term careers of family medicine. It is pointed out that the real shortage in the medical system is not in a new specialty to replace the vanishing general practitioner, but rather in primary care. The Family Practice Act, it is noted, limits approaches to dealing with the shortage of primary care manpower to increasing numbers of family practice specialists. Alternatives to the family practice strategy are suggested. Excerpts from the Family Practice Act and a summary of relevant provisions of the Comprehensive Health Manpower Training Act of 1971 are appended. A bibliography is included.

HRP-0008826/0GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
MEDEX Program in the State of Washington: A Model for the Introduction of Mid-Level Health Workers.
Richard F. Gorman. May 74, 19p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: *Washington(State), Veterans, Physician extenders, *Physician assistants, Measurement, Health resources, Health occupations, *Health manpower, Health care utilization.

Experience through May 1974 of the MEDEX program in the State of Washington is recounted in an effort to identify components of process planning and strategies involved in introduction of mid-level health workers into the Nation's health and medical services delivery systems. The MEDEX program in Washington was the first in the Nation to use the skills of highly trained returning military corpsmen to assist physicians in providing more and better care to the civilian population. The program, co-sponsored by the University of Washington and the Washington State Medical Association, provides skilled corpsmen with 12 months of intensive training, including a nine-month preceptorship with physicians who have agreed to employ the MEDEX at the end of his training program. It is suggested that the MEDEX program provides an ideal model for introducing mid-level health workers into the health care delivery system by: (1) identifying effective economic demand for physician extenders with primary care physicians in rural settings; (2) ensuring that training programs reflect the identified demand; (3) utilizing the support of the State Medical Association; (4) providing for monitoring of quality of care delivered by the physician - MEDEX team through State Medical Association peer review mechanisms; (5) providing rules and protocols for physician extenders as developed on an ongoing basis by the State Board of Medical Examiners, assisted by the State Medical Association; and (6) assuring success by attaching the MEDEX to the physician with whom he trains and with whom he associates after training is completed. Implications of the MEDEX experience for physician extender certification are discussed.

HRP-0008836/9GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
How Much Does Medical Education Cost: A Review.
Owen MacBride. Aug 73, 44p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: United States, Health education, Health care costs, Costs.

Studies on medical school costs are reviewed. Problems in estimating medical school cost functions are noted, including school objectives, multiple outputs and cost allocations among programs, resource transfers among programs, proper valuation of resources used, and lack of accurate cost data from all medical schools for comparison purposes. Methodologies described for the evaluation of average costs per student are categorized as follows: (1) net amount contributed method, which involves subtracting from total expenditures of a school all revenues from programs not directly associated with education; (2) costing, which involves carefully defining medical school programs and explicitly identifying expenses and activities which enter into the production of each medical school program; (3) input / output analysis, which attempts to measure accurately interdepartmental resource transfers and output from some programs which becomes input into other programs; (4) constructed costs approach, which involves asking medical school experts what educational costs would be in model medical schools; and (5) joint costs approach, which attempts to allocate the total costs of a medical school to its various programs. Empirical studies on medical costs are reviewed, and it is concluded that these studies show no consistent pattern in educational costs over time. Tabular data on medical school costs and a bibliography are included.

HRP-0008837/7GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
State Planning for Mid-Level Health Workers: Synopsis of a Conference.
Irene Butter. Jun 75, 35p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Strategy, *Michigan, Methodology, Health resources, *Health planning, Health occupations, *Health manpower.

Proceedings are summarized of a conference that was held in May 1974 at Waldenwoods, Michigan to evaluate State planning for mid-level health workers in Michigan. The following topics were addressed at the conference: (1) environment of the planning process (health care system environment and political environment); and (2) political process of planning (strategies for involving diverse interest groups and for building new constituencies, strategies for manipulating the decision-making process, and general observations on strategy). The main objectives of the conference were to initiate dialogue, to explore a variety of experiences with mid-level health workers at the State level, and to extract from conference discussions some lessons of potential value to other States. It was concluded that, until fundamental changes in health care delivery are accomplished, mid-level health workers cannot be successful in helping to remedy problems of the health care system. It was also concluded that the very nature of planning for mid-level health workers is controversial in its expression of activity directed toward the success of mid-level health workers and, by extension, toward change in the present health care system. Mid-level health worker planning, since it cannot be disassociated from the political process, necessitates multiple strategies for broadening support and developing consensus.

HRP-0008838/5GA PC$3.50/MF$3.00
Health Planning Council of the Midlands, Omaha, Nebr.
Developmental Disabilities: Survey Report.
18 May 73, 18p

Descriptors: State regions, Rural health services, Rural areas, Research, Mental health, Mental health care, Iowa, *Health resources, *Health care services, *Health care facilities, Health care delivery.

A survey of facilities and services for the developmentally disabled in the seven Iowa counties served by the Health Planning Council of the Midlands is documented. Objectives of the survey were: identification of all services available; analysis of the interrelationships among existing services; provision of information to aid in assessing the adequacy of the existing system and in identifying service gaps; service gaps; estimation of the number and location of individuals requiring but not receiving services; assessment of manpower requirements; and development of a plan to improve the delivery system. A questionnaire containing items derived from the Federal Standards for Services and Programs for the Developmentally Disabled was mailed to 85 providers throughout the seven counties, and interviewers met with all questionnaire recipients to assist with completion of the forms. To obtain information on the number of developmentally disabled individuals in the area, questionnaires were forwarded to 61 physicians. Low response to the physician questionnaire precluded assessment of the number of developmentally disabled in the area. Tabular summaries are presented of the resources in each county. A review of the tabulation leads to the conclusion that all counties lack a complete system for serving the developmentally disabled. Among obstacles noted by survey respondents are: inadequate financial resources, lack of coordination among services and agencies, time-consuming bureaucratic procedures, insufficient staff, lack of services within communities of residence, limited employment opportunities in rural areas, public attitudes toward some disability groups, and misconceptions of agency purposes. Resistance of facilities and organizations in the area to the survey is noted, and suggestions for future surveys are offered. A copy of the questionnaire is not included.

HRP-0008839/3GA Not available NTIS
American Hospital Association, Chicago, Ill.
Readings in Hospital Central Service.
1975, 166p
Available from the American Hospital Association, 840 North Lake Shore Drive, Chicago, Ill. 60611, $13.50.

Descriptors: Sources, Occupational safety and health, Methodology, Management methods, Health related organizations, Health planning agencies, Health care facilities, Financial management, Environmental health, Documents, Availability.

A collection of articles is presented which focuses on the role of hospital central service personnel in the preparation of medical / surgical supplies and equipment used in patient care. The 35 articles included were selected by the 1973 and 1974 boards of directors of the American Society for Hospital Central Service Personnel. The collection presents administrative, planning, operations, and infection control techniques of use to hospital central service department administrators and personnel involved in the receiving, storage, issuance, and preparation of sterile supplies. Among topics discussed are: management and supervision, training, legal considerations, standards and quality control, supply distribution and control, waste disposal, and specific aspects of infection control. Several of the articles are are accompanied by drawings, photographs, graphs, and tabular data.

HRP-0008841/9GA Not available NTIS
National Inst. of Mental Health, Rockville, Md.
Administration of Mental Health Services.
Saul Feldman. 1973, 419p

Available from Charles C. Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill. 62703, $18.50.

Descriptors: Personnel management, Orientation(Training), Organization theory, Methodology, *Mental health care, Management methods, Health resources, Health related organizations, Health planning agencies, Health care services, Financial management, Community relations.

A comprehensive approach to administration in the mental health setting is deatiled in a text written for academic programs in mental health and health administration and for those working in the field of mental health. Administration is viewed as a leadership process inseparable from policy and central to organizational effectiveness. It is noted that, in marked contrast to its predecessors, the prototype mental health organization of the 1970's is a complex, frequently decentralized service system with various levels of accountability and close ties with other human services. Mental health services are considered to be moving in the following directions: increased scope and resources, larger and more diverse staffs, complex organizational patterns, multiple funding sources, multiunit systems coordinated with other services, sophisticated management information and evaluation, close involvement with government at all levels, greater community involvement, and increased sensitivity to change. The administration of mental health services is discussed with regard to the financing and budgeting of mental health services, community involvement in the decision-making process, relation between mental health and other human services, planning, special problems of managing mental health professionals, politics and mental health services, organizational behavior and change, and management information.

HRP-0008846/8GA Not available NTIS
George Washington Univ., Washington, D.C.
Policy Analysis: Introduction and Applications to Health Programs.
Marvin R. Burt. 1974, 142p
Available from the Information Resources Press, 2100 M Street N.W., Washington, D.C. 20037, $14.50.

Descriptors: United States, Strategy, Quality assurance, Methodology, Measurement, *Health planning, Health care.

The application of policy analysis to health programs is discussed. Policy analysis is defined as a practical philosophy to assist a decision-maker with complex problems of choice under conditions of uncertainty; it is intended to be an alternative or supplement to more traditional methods of decision-making based on incrementalism, intuitive judgment, and trial and error methods of operation. It is characterized by a systematic approach encompassing the definition of a problem or issue in question, statement of government objectives and criteria by which the achievement of those objectives can be measured, consideration of alternative programs or policies for achieving objectives, and selection of preferred alternatives based upon evaluation criteria and consideration of other factors including political constraints and feasibility. The following stages in policy analysis are identified: formulation, search, explanation, interpretation, and verification. Policy analysis is examined in relation to problem structuring, analysis design, and conceptual framework development. As applied to health programs, policy analysis involves building a model and conducting analyses, with attention given to estimating program costs and measuring program effectiveness. Case histories are presented to illustrate the application of policy analysis to health programs, including maternal and child health care programs, New York's emergency ambulance service, and family planning for American Indians. The structure of a comprehensive health center is addressed in an appendix, and a bibliography is provided.

HRP-0008861/7GA PC$4.50/MF$3.00
Pennsylvania Univ., Philadelphia. Government Studies Center.
Design of a Simulation Model of Personal Health Services in an Urban Area.
Final Rept.
Boyd Z. Palmer, and Charles I. Goldman. Mar 70, 65p

Descriptors: *Urban health services, Urban areas, System analysis, Strategy, Public health, Methodology, *Health planning, Health care, *Health care services, Data processing, Data processing systems, Data analysis.

A simulation model of personal health services in an urban area, developed to assist urban public health administrators in long-range planning, is described. The model is based on the assumption that the health system is able to improve the health status of individuals by providing different types of services at many different sites, with the amount of improvement dependent on the amount of service received, measured in man-days of key manpower time. The formulation includes estimates of necessary manpower time for each service, if service is to meet ideal professional standards. Health status transition matrices are used to compute changes in health status. One matrix estimates changes in health status given ideal care, and another estimate changes if no care is given. Actual transitions are interpolated between the two, based on the ratio of capacity (amount of manpower time available) to demand, or manpower time required if each individual is to receive the best possible care. Public health administrators are assumed to increase capacity of public health services and to persuade nonusers of the health system to use the services through capacity-adding projects and activities. The impact of such changes is measured via indicators based on changes in health status. Sample output of a computerized version of the model, based on hypothetical data, is appended. Future development alternatives are suggested, emphasizing potential uses of the model in the training of administrators, in developing planning systems in public health departments, and in regional comprehensive health planning. Flow diagrams and supporting data are included.

HRP-0008866/6GA PC$7.50/MF$3.00
Harvard Center for Community Health and Medical Care, Boston, Mass.
PSRO Information and Consumer Choice: The Case for Public Disclosure of Health Services Data.
Lawrence Kirsch, Isidore Altman, Todd Frazier, Joel Kavet, and Jedediah Mannis. Feb 75, 195p

Descriptors: Sources, Reviewing, Quality assurance, *PSRO(Professional Standards Review Organizations), *Professional standards review organizations, Peer groups, Methodology, Measurement, Massachusetts, Management methods, Legislation, Law(Jurisprudence), Health resources, Health related organizations, Health planning agencies, Health education, Health care, Health care delivery systems, Data, Coordination, Cooperation, Consumers, Availability.

The potential impact upon consumers of the federally mandated Professional Standards Review Organizations (PSROs) is examined in a report focusing primarily on the issue of public disclosure. The standard setting and review functions of PSROs in the medical sector are explored, and the potential importance of PSRO data and information for consumers as individuals and as a group is assessed. The legal basis for consumer entitlement to PSRO information is considered. Analysis of the substantative tasks of the PSROs leads to the conclusion that adoption of a restrictive public disclosure policy would adversely affect the consumer interest in that such a policy would unfairly deny the consumer free access to information that might be material to informed choice. It is suggested that consumer protection agencies, working in cooperation with PSROs and the medical profession, take the lead in developing and testing methods of assembling, analyzing, and disseminating PSRO-generated information to consumers. Recommendations are offered for a policy of full public accountability for Massachusetts PSROs. Excerpts from relevant statutes are appended.

HRP-0008887/2GA PC$4.50/MF$3.00
Government Studies and Systems, Inc., Philadelphia, Pa.
Statement of Health Issues to be Addressed by Model Health Plans.
26 Nov 74, 58p
Contract PHS-HRA-106-74-34

Descriptors: United States, Strategy, Methodology, *Health planning, Documentation, Development, Data acquisition.

Health issues to be addressed by local health planning agencies are identified in a technical aid for health planners developed for the Division of Comprehensive Health Planning, Department of Health, Education, and Welfare. Following a review of legislation relating to local health planning and a discussion of basic assumptions and definitions, listings of health status issues and health system issues are presented. Health status issues are classified as dysfunction, morbidity, combined dysfunction and morbidity, and risk. Health system value issues include: availability, accessibility, and acceptability; continuity of care; quality of care; service integration; and economic feasibility. Related technical issues and information questions are enumerated for each value issue. In addition, issues which a health plan should address, but which are not solely within a local agency's jurisdiction, are identified, including: legislative issues; research issues; and related systems issues, such as education, welfare, housing, transportation, and protection. Appended materials include an outline of planning issues linked to the project review function; information on health status classification; examples of organizing principles of health care delivery components; and guidelines for selecting health system taxonomies.

HRP-0008889/8GA Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
Facts and Trends on Hospital Outpatient Services.
Jun 64, 32p
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $0.80.

Descriptors: United States, Health care utilization, Health care services, Health care facilities, *Ambulatory health care.

As an aid in evaluating and planning for hospital outpatient services, facts and trends relative to hospital-based outpatient care are presented. Following definitions of relevant terminology, an outline is presented of planning factors, including population and community characteristics, vital statistics and health needs, resources, utilization, patterns of medical practice, data on quality of services, and trends. Examples of questions to be considered in planning and evaluation of hospital outpatient services are provided. A guide for collection of inpatient and outpatient data from existing facilities is presented. Data current as of 1962 and projected through 1970 are presented on

hospital and outpatient service utilization, trends in utilization of emergency outpatient services, and outpatient services in teaching hospitals in the U.S. Physical facilities for outpatient services, including location, space, layout, and mechanical equipment for environmental control, are considered.

HRP-0008958/1GA Not available NTIS
John F. Kennedy School of Government, Cambridge, Mass.
Productivity Potential of the Physician Assistant.
Richard Zeckhauser, and Michael Eliastam.
1972, 22p
Pub. in Jnl. of Human Resources v9 n1 p95-116 1974.

Descriptors: Productivity, Physician extenders, *Physician assistants, Methodology, Medical personnel, Measurement, Health occupations, Health manpower, Health care, Health care utilization, Data processing, Data analysis.

A production function methodology is developed for estimating the potential contribution of physician assistants (PAs) in the delivery of medical care. The primary purpose of the methodology is to determine how PAs can be used to substitute for physicians. Data from an urban health center providing adult and pediatric services to a target population of 25,000 are used to analyze possibilities for the delegation and efficient assignment of medical tasks to PAs. From this analysis, a numerical production function is developed for physicians and PAs working together. With an optimal mix of factor inputs and an efficient distribution of task assignments, it is estimated that the PA achieves the productivity of one-half that of a full-time physician. Supporting data are included.

HRP-0008982/1GA Not available NTIS
Union Coll., Schenectady, N.Y.
Planning an Emergency Department Holding Unit.
Edward Hannan. 1975, 10p
Grant PHS-MS-00709
Pub. in Socio-Economic Planning Sciences v9 n5 p179-88 Oct 75.

Descriptors: System analysis, State regions, Methodology, Massachusetts, Health resources, Health care, Health care utilization, Health care requirements, Health care facilities, Forecasting, *Emergency medical services, Data processing, Data processing systems, Data analysis, Computer software.

A generalized computer simulation model of the queuing process in an emergency department holding unit is presented that was developed to evaluate the effects of changes in demand and utilization policies upon congestion in the unit. Bed utilization percentages, census level, and daily service level criteria are used to measure congestion. The FORTRAN IV simulation model also may be used to determine when additional staff are needed and to investigate the extent to which economies of scale exist. The Springfield, Massachusetts Hospital Medical Center holding unit is used to demonstrate how the model may be applied to an existing unit, in planning for a future holding unit, and in investigating alterations in the system such as increases in demand, use of the holding unit as a short-term care unit, reducing the night admission staff, and other changes. Data collection procedures, supporting data, and a chart tracing patient flow in the holding unit model are included.

HRP-0008987/0GA Not available NTIS
Bernard M. Baruch Coll., New York.
Nursing Home Cost Analysis: A Case Study.
Hirsch S. Ruchlin, and Samuel Levey. 1972, 13p
Contract PHS-HSM-110-69-413
Pub. in Inquiry v9 n3 p3-15 Sep 72.

Descriptors: Utilization, Patients, Methodology, Measurement, Massachusetts, Long term care, Inpatients, Health care, Health care facilities, *Health care costs, Data processing, Data analysis.

An analysis of nursing home cost patterns is presented, based on detailed cost data obtained from 175 Massachusetts nursing homes for the period 1965-1969. The study includes a detailed description of cost trends identified in the sample, followed by an analysis of total per diem cost determinants. Statistical results are discussed and related to broad policy issues. Three major conclusions emerge from the analysis of annual cost trends: (1) major recorded cost increases occurred immediately after inauguration in 1967 of the Medicare - Medicaid program for nursing home care; (2) for the entire study period, the real increase in the Medicaid rate exceeded the increase in average total costs; and (3) per diem expenditures for some cost components directly affecting quality of care provided, e.g., recreation, rehabilitation, and other services, were relatively insignificant, accounting for only 1.5 percent of total costs. A regression analysis is employed to determine the net effect of each of the sample stratifying variables (size of nursing home, ownership, certification, age, and region, and exogenous variables such as occupancy rate, patient day distribution, and changes in reimbursement formulas) on average total cost and on each cost component. Analysis results generally support the hypothesis that positive relationship exists between cost and ownership and certification, respectively, and that a negative relationship exists between cost and size, age, percent public days, and occupancy rate, respectively. The postulated positive relationship between cost and region is not supported by the analysis. Implications of the findings for considerations of proprietary versus voluntary institutions and of optimal size for nursing homes are discussed. Supporting data are included.

HRP-0009000/1GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Attitudes and Approaches to Dentist's Use of Assistants: A Literature Review.
Ann Webster. Sep 73, 44p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: United States, Health resources, Health occupations, Health manpower, Health care utilization, Dentists, *Allied health personnel.

A review of the literature on the use of dental auxiliaries is presented. The use of auxiliaries by dentists is one way to increase productivity and income. Several studies documenting expanded duties for assistants indicate that increased productivity is dependent not only on increased numbers of auxiliaries, but also upon the utilization of expanded skills. In the studies cited, dental teams with three or four expanded duty assistants (EDAs) were the most efficient. The Dental Auxiliary Utilization Program (DAU) of DHEW was designed to train dental students in the effective use of chairside assistants. It is concluded that dental graduates with high DAU exposure are more likely to hire a chairside assistant; however, the DAU program does not appear to have a significant impact on a dentist's behavior. A 1970 study of State laws indicates that States which provide for expanded duties by dental auxiliaries have less favorable dentist / population and hygienist / dentist ratios than States with no such provisions. Evidence exists that U.S. dentists are ambivalent about expanded duties for dental auxiliaries because they fear the development of a paraprofessional will decrease demand for the dentist's services. Some dentists claim that delegating duties to EDAs will lower the quality of care. However, when faced with an acute increase in demand for dental services, dentists appear willing to increase the number of auxiliaries and to delegate more duties.

HRP-0009003/5GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
International Migration of Physicians and Nurses.
Irene Butter. Nov 73, 13p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Statistical distributions, Registered nurses, Population migrations, *Physicians, *Nurses, Health resources, Health occupations, *Health manpower, Health care, Foreign countries, Distribution, Demography, Communities.

Background information on the international migration of physicians and nurses is provided for a study to be conducted by the World Health Organization. The duration of such migration may range from brief training periods, through more extensive educational and professional ventures, to long-term or permanent residence. Not only individuals, but also countries, display different migration patterns. Countries may be either donors or recipients or both, and the migration pattern may vary among countries. Concern about the migration of physicians and nurses has centered around a steadily growing magnitude of migration as well as the direction of flow from less developed to more advanced countries. In addition, migration has been found to accentuate geographic maldistribution of manpower and to jeopardize the growth potential of donor countries. While the magnitude of migration flows is partially documented, information on origin, destination, retention, and re-migration is limited. The establishment of a comprehensive, continuous, and coordinated international migration information system is urged.

HRP-0009006/8GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Regulating Dental Assistants: Revisions of the Michigan Dental Practice Act.
Paul J. Feldstein, Owen MacBride, and Stephen Crane. Nov 73, 24p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Quality assurance, Michigan, Methodology, Medical personnel, Licenses, Legislation, Law(Jurisprudence), Health occupations, Health manpower, Health care, Health care delivery systems, Employment, Credentials, Certification, *Allied health personnel.

Proposed changes in Michigan's Dental Practice Act to allow greater utilization of expanded function auxiliaries (EFAs) are analyzed. The analysis is based on three arguments: increases in dental productivity can result from the increased use of auxiliaries; to achieve maximum dental productivity, as few restrictions as possible should be placed on the functions of the auxiliary; and educational and training requirements for dental auxiliaries should be as flexible as possible. Several studies in the U.S. and other countries are cited which show that the use of EFAs can appreciably increase dental productivity. It is concluded that the evidence argues for liberalization of restrictions on the functions to be delegated to hygienists and assistants. The studies also indicate that the quality of dental care will not suffer, but will improve with greater utilization of dental auxilia-

ries. It is recommended that precise educational and curriculum requirements for program accreditation be eliminated, and that competency for dental auxiliaries be assessed on the basis of proficiency examinations. It has been found that on-the-job training can develop skills comparable to those of highly educated dental auxiliaries at a greatly reduced cost.

HRP-0009008/4GA Not available NTIS
Michigan Univ., Ann Arbor. Health Manpower Policy Studies Group.
Why Should We Subsidize Medical Education.
George E. Wright. Feb 74, 40p
Available from the Health Manpower Policy Studies Group, University of Michigan, Ann Arbor, Mich. 48104, $.50.

Descriptors: Universities, United States, Students, Schools, Physicians, National government, *Health manpower education, Health education, Financing.

The justification of public support to medical schools is discussed in light of the increase in the total Federal, State, and local funding of medical schools from an annual rate of $320 million to over $1.2 billion in the decade since 1962. Objections to the level of subsidies as of 1974 implicity recognize two major criteria by which one can evaluate any public subsidy program: (1) the equity or fairness by which funds are transferred from taxpayers to beneficiaries; and (2) the changes in social welfare created by reallocating resources from one use to another. In the case of medical schools, there are four major reasons why unsubsidized education, with the student paying full costs, might lead to an underproduction of physicians: market structure, spillovers, artificial prices, and risk and imperfect information. It is concluded that the arguments that arise from any of these rationale, as well as analysis according to the two major criteria for public subsidy programs, do not support the validity of medical education subsidies at the 1974 level. The influence of the competitive world in which medical schools actually exist, however, argues against a shift to a full-cost tuition policy, which would ignore the effects of subsidies on other disciplines, as well as on research and health care support, and the probable drop in application rates. The question, it is then concluded, is not one of subsidy or no subsidy, but rather of how much subsidy. Federal intervention in capital markets is recommended as an alternative to increased subsidies so that medical students can finance their education and individual medical schools can modernize and expand their operations. Supporting data are included.

HRP-0009076/1GA Not available NTIS
California Univ., Berkeley. Dept. of Architecture.
Uncoupling the Radiology System.
Roslyn Lindheim. 1971, 91p
Available from the Hospital Research and Educational Trust, 840 North Lake Shore Drive, Chicago, Ill. 60611, $2.95.

Descriptors: Revisions, Health care technology, *Health care facilities, Design.

A detailed analysis of the internal activity of the hospital radiology department is presented, focusing primarily on the specific problems affecting the design of radiology departments. Within the broader scope of the study, which was to develop methods of analysis and research that could provide the architect with a sound basis for arriving at design decisions, the radiology department was chosen for detailed analysis because it presents, in capsule form, many of the problems encountered in the design of other hospital departments. Three hospital radiology departments were included in the study: one in a typical community hospital (200 beds), one in a university hospital (550 beds), and one in a hospital and associated clinic operated by a large prepayment plan (275 beds). The study report includes: discussions of new approaches for hospital design decisions; the context of the problem (trends in radiology utilization and manpower); the goals of radiology department design (including efficiency, maximum utilization, and flexibility for growth and change); calculation of the size of diagnostic x-ray departments; a study of the diagnostic radiology system; and uncoupling the system to provide spatial flexibility. It is noted that design problems posed by the rapidly changing and complex requirements of the radiology department require a team approach involving radiologists, equipment manufacturers, sociologists, economists, industrial engineers, nurses, administrators, patients, and the architect. Supporting data are included.

HRP-0009110/8GA Not available NTIS
American Academy of Pediatrics, Evanston, Ill.
Continuing Medical Education Through Self-Evaluation.
C. W. Daeschner, and Gerald E. Hughes. 1970, 3p
Pub. in Pediatrics v45 n5 p729-31 May 70.

Descriptors: Physicians, *Health manpower education, Health education, Continuing education.

The development and content of the self-evaluation and education program (SEEP) is described. SEEP was introduced in 1970 by the American Academy of Pediatrics as a continuing educational opportunity for its members and for interested nonmembers. Based on the self-assessment program of the American College of Physicians, SEEP is presented in an examination format, but is, in fact, an individual postgraduate course aimed at assisting the pediatrician in determining his own strengths and weaknesses and in determining how well he can deal with problems considered important by those assembling the SEEP material. Reference materials are provided along with answer sheets to provide a study guide for the pediatrician once he has identified any gaps in his medical knowledge through the examination. It is emphasized that the primary purpose of SEEP is not external examination but rather self-assessment aimed at motivating for self-education. SEEP materials relate to fourteen categories of problems: behavior, social, development, and learning disorders; cardiology; dermatology; gastroenterology; immunity and immunizations; infectious diseases; metabolic and endocrine; newborn; genetics; respiratory; therapeutics; poisoning; renal, fluid, and electrolytes; and neurology. The first two booklets of the SEEP package contain 250 multiple choice items and are designed primarily to measure information. The third book contains a modified patient management approach designed to evaluate cognitive and effective performance. The reference bibliography accompanying the answer sheet lists articles covering all questions in the booklets.

HRP-0009118/1GA Not available NTIS
Harvard Medical School, Boston, Mass. Lab. of Community Psychiatry.
Guide to Mental Health Services.
Edward T. Heck, Angel G. Gomez, and George L. Adams. 1973, 151p
Available from the University of Pittsburgh Press, 127 N. Bellefield St., Pittsburgh, Pa. 15260, $2.95.

Descriptors: Mental health, *Mental health care, Health resources, *Health education, Health care services, Health care facilities, Consumers.

Information on mental health services, practitioners, and treatments is presented in a guide for the user of mental health services. The guide is intended not as a directory of services, but rather as a compilation of information about a broad range of mental health topics of use to community workers and consumers in seeking out and evaluating local mental health services. Topics discussed are: mental health and mental illness; some mental health professions; diagnosis (defining mental problems); treatment (solving mental problems); residential or inpatient treatment facilities; mental health clinics (outpatient treatment facilities); mental health treatment programs in the schools; comprehensive community mental health centers; mental health services for special populations; sources of mental health information; and encouraging citizen participation in mental health activities. It is noted that, although the guide is addressed primarily to community workers with the responsibility of guiding people in need to and through the mental health service system, the ultimate beneficiaries of the guide should be the people who need mental health services and the families of these people.

HRP-0009175/1GA Not available NTIS
Integration of Medical Research and Health Policies.
Stephen P. Strickland. 1971, 11p
Pub. in Science v173 n4002 p1093-1103 17 Sep 71.

Descriptors: United States, Research and development, Projects, Policies, Objectives, Methodology, Health resources, Health planning, Health occupations, Health care facilities, *Health care delivery, Guidelines, Financing.

The integration of medical research efforts with health policies from 1950 to 1970 is discussed. Senate debate over the establishment of a national cancer research effort is reviewed, along with other medical research policy developments. It is argued that a medical research policy has been in existence over the past two decades, although its purposes may have been misinterpreted. Early activities in the Federal funding of medical research and development are noted, as well as government's financial commitment to medical research in the 1960s. Medical research represented 38 percent of DHEW health expenditures in 1955, 34 percent in 1965, and 10 percent in 1970. It is felt that medical research has been forced to serve as national health insurance since a comprehensive system is lacking for applying existing knowledge and techniques of health care to all persons specifically in need of them. Medical research is examined in relation to medical education, and the integration of medical research and health care programs is considered.

HRP-0009200/7GA Not available NTIS
Greater Detroit Area Hospital Council, Inc., Mich.
What Trustees Should Know About the Planning Law.
Symond R. Gottlieb. 1975, 5p
Pub. in Trustee v28 p12-19 Jul 75.

Descriptors: United States, Systems, Plans, Organization theory, Methodology, Legislation, Law(Jurisprudence), Health resources, Health related organizations, *Health planning, Health care services, Health care delivery, Health care delivery systems, Development, Data acquisition.

Provisions of the National Health Planning and Resources Development Act of 1974 (P.L. 93-641) are described, the probable impact of the legislation on hospitals and health care providers in the private sector is considered, and implications for hospital trustee decision-making responsibilities are discussed. P.L.93-641 mandates a new program of comprehen-

sive health planning and establishes a network of Federal, State, and local agencies through which health planning, regulation, and resource allocation will be conducted. The important feature of the new legislation is the structure of external management which comprises six key units: (1) Secretary of Health, Education, and Welfare, responsible for developing regulations, approving almost every aspect of the performance of other units, developing tools, and providing technical assistance; (2) 15-member National Council on Health Planning and Development; (3) 10 regional offices of DHEW, responsible for providing technical assistance to State and substate agencies and for monitoring their performance; (4) State health planning and development agencies, responsible for planning and administration of regulatory authorities and for administration of capital development funds under the act; (5) State health coordinating councils, the governing bodies of State health planning and development agencies; and (6) health systems agencies, the basic building blocks of the system. It is noted that the legislation does not diminish the responsibilities of hospital governing boards but rather expands the planning and decision-making role of trustees. Hospitals must, however, be accountable to the community for their decision-making processes and must work to influence and participate in the external decision-making process as represented by the structure mandated by P.L. 93-641.

HRP-0009203/1GA Not available NTIS
Duke Univ., Durham, N.C.
Role of Formal Education.
Terry Sanford. 1975, 9p
Pub. in the Jnl. of Medical Education v50 n1 p3-11 Jan 75.

Descriptors: Universities, Schools, Safety engineering, *Public health, *Preventive medicine, Methodology, Health resources, Health related organizations, *Health education, Health care technology, Consumers, Ailments.

The role of medical professions and educational institutions in teaching the public about health and the benefits of preventive medicine is discussed by the president of Duke University in an Alan Gregg Memorial Lecture delivered at the 85th Annual Meeting of the Association of American Medical Colleges in November 1974. It is noted that the challenge confronting the medical profession and the formal education system is not merely one of offering health education to the public but one of selling the public on the merits of health education. Preventive care through education is seen as the best approach to problems of mental illness, cardiovascular disease, and cancer. Experiences in other countries are cited which indicate that popular health education is attainable even under discouraging circumstances. It is suggested that too much time has been spent on identifying who needs health care information and not enough on devising methods of effectively communicating that information. Ways in which public schools and other institutions can stimulate public interest in health care are noted. It is suggested that a university may participate both inside and outside of its immediate sphere by championing the cause of health education. A university, it is observed, has the intrinsic capacity to work solutions in virtually every field of public interest, including health care. Responsibilities of legislators and of Federal and State governments are noted in regard to public health. It is emphasized that those concerned with the treatment of illness must encompass the prevention of illness.

HRP-0009221/3GA Not available NTIS
California Univ., Davis. Dept. of Family Practice.
Assistants to Primary Physicians in California.
Lan Hughes Andrus, and Mary Fenley. 1974, 7p
Pub. in the Western Jnl. of Medicine v122 p80-86 Jan 75.

Descriptors: United States, Standards, Quality assurance, Physician extenders, *Physician assistants, Methodology, Medical personnel, Licenses, Legislation, Law(Jurisprudence), *Health resources, Health occupations, Health manpower, Health care, Health care utilization, Health care delivery systems, Employment, Criteria, Credentials, Certification, *California.

Professional roles of nurse practitioners and physicians' assistants in the delivery of primary health care in California are examined. The Family Nurse Practitioner Program in the Department of Family Practice at the University of California (Davis) is noted as a leader in the development and preparation of nurse practitioners. The program includes one year of didactic instruction and clinical practice, followed by a six-month internship. The legal constraints concerning mid-level practitioners are assessed, based on the physician's assistant law and the Experimental Manpower Act enacted in California. It is felt that more comprehensive laws are needed to permit optimal utilization of nurse practitioners and physicians' assistants. National standards for mid-level practitioners and the certification of national programs for such practitioners are discussed. It is concluded that national agencies for the approval of teaching programs and testing of individual graduates will play an increasing role in accreditation and certification procedures. Consideration is given to patient acceptance of nurse practitioners and physicians' assistants, their changing roles, communication and supervision, and methods for paying mid-level practitioners. It is felt that professional role difficulties are being resolved and that a more equitable and patient-oriented primary physician's assistant system is evolving.

HRP-0009225/4GA Not available NTIS
Bureau of Health Resources Development, Bethesda, Md. Div. of Dentistry.
Legal Provisions on Expanded Functions for Dental Hygienists and Assistants.
Jul 74, 102p DHEW/HRA-75/21
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, $1.70.

Descriptors: United States, Regulations, Legislation, Law(Jurisprudence), Health occupations, Health manpower, Health care utilization, Health care delivery systems, *Allied health personnel.

State-by-State and national summaries of legal provisions concerning dental auxiliary functions are presented. The directory contains information based chiefly on materials received through the end of 1973 in response to inquiries to State boards of dentistry. In 1973 dental law was amended with regard to dental auxiliary functions in Connecticut, Maryland, Michigan, New York, and Vermont and rules and regulations were newly issued or significantly revised by Florida, Georgia, New Hampshire, New York, Virginia, and West Virginia. At the end of 1973, there were 44 States which, in one manner or another, authorized expanded functions for dental auxiliaries. In five of these States the legislature had amended the dental law, but the board of dentistry had not, at the time of publication, issued implementing rules and regulations. For each State, summaries and interpretations are presented of those provisions which establish and regulate the tasks of dental hygienists and assistants, with special attention to expanded functions. A national summary consolidates, in tabular and graphic form, the information contained in the entries for the individual States.

HRP-0009227/0GA Not available NTIS
Michigan Univ., Ann Arbor. Dept. of Architecture.
Planning for Cardiac Care: A Guide to the Planning and Design of Cardiac Care Facilities.
Colin W. Clipson, and Joseph J. Wehrer. 1973, 412p
Available from the University of Michigan Press, Ann Arbor, Mich. 48103, $20.00.

Descriptors: Revisions, Patients, Michigan, Inpatients, Health care technology, Health care requirements, *Health care facilities, Design.

Facility needs of cardiac care units are reviewed, based on the Michigan Comprehensive Coronary Care Project initiated in September 1969. A survey was made of physicians, nurses, administrators, engineers, architects, and other health specialists to develop guidelines for the planning and design of cardiac care facilities. Under the Michigan project, hospitals were selected in which the caseload of cardiac patients was sufficient to justify an intensive cardiac care unit, and these hospitals were encouraged to renovate existing facilities for intensive cardiac care or to include plans for such units in new buildings. Guidelines for determining the facility needs of cardiac care units are described in detail. Such guidelines can provide assistance in the following areas: orientation for hospital administrators and boards of trustees, evaluation of the effectiveness and utilization of coronary care units, cardiology teaching and consultation, resources for design and construction, indepth assessment of a hospital's primary service area and determination of the number of beds and type of services needed to serve the anticipated myocardial infarction caseload, consultation on equipment selection, development of policies (staffing, medical and nursing management, and medical - legal problems), nursing consultation in training (unit management, motivational techniques, inservice education, and nursing policies), and education and information. Appendices provide information on a mockup cardiac care unit developed to study unit requirements in a controlled, simulated environment; questionnaire form used to survey cardiac units in 120 hospitals; and questionnaire form developed by the Michigan Comprehensive Coronary Care Project in 1971 to collect data which would allow the development of a set of risk factors for cardiac patients.

HRP-0009228/8GA Not available NTIS
Yale Univ., New Haven, Conn. Dept. of Public Health.
Trends in Medical Specialization in the United States.
Rosemary Stevens. 1970, 11p
Grant PHS-HS-00374
Pub. in Inquiry v8 n1 p9-19 Mar 71.

Descriptors: United States, Statistical distributions, *Physicians, *Health resources, Health occupations, *Health manpower, Health care, Distribution, Demography, Communities.

The history of physician specialization in the United States is reviewed, and existing and future specialist manpower patterns are discussed. In 1968 there were 317,000 physicians in the U.S., 21 percent of whom were general practitioners and 79 percent specialists. It is noted that, although the proportion of general practitioners has been declining rapidly since the early 1950s, the self-classification system used by the American Medical Association is the only source of information on what physicians actually do; therefore, trends at times may reflect changes in perception rather than actual job descriptions. In light of the continuing decline in general practice and the substantial focus on surgery, the need for a specialist manpower policy is pointed out. Given the continuation of the trends noted, the

country appears to be heading toward a health service system which is increasingly financed through public funds and fed by a professional education structure which is producing an appropriate supply of physicians. Several approaches to specialist manpower redistribution are noted: limiting the number of available positions offered for training in each specialty and in each geographical region; introducing a system of financial and other inducements for training in needed specialty areas; and placing a ceiling on the number of practitioners to be licensed in a given specialty. Closed - staff health service systems in place of the existing, largely individualized practice system and efforts to provide incentives in the specialist training system are singled out as the most likely approaches to readjustment of specialty trends in the future. Barriers to such readjustment are discussed.

HRP-0009230/4GA Not available NTIS
North Carolina Univ. at Chapel Hill. Dept. of Health Administration.
National Health Planning in the United States: Prospects and Portents.
Leonard S. Rosenfeld, and Irene Rosenfeld.
1975, 13p
Pub. in the International Jnl. of Health Services v5 n3 p441-53 1975.

Descriptors: United States, Policies, Organization theory, Objectives, Methodology, Legislation, Law(Jurisprudence), Health resources, Health related organizations, *Health planning, Health care services, Health care delivery systems, Guidelines.

Provisions of the National Health Planning and Resources Development Act of 1974 (P.L. 93-641) are reviewed in relation to problems encountered in earlier health planning efforts. Areas in which the legislation is said to make good use of past experience include: provision of complete coverage of the United States by planning agencies serving geographically functional units; more generous Federal support than that authorized under comprehensive health planning legislation; improved prospects for better staffing of local planning agencies; more effective technical assistance; and provision for adoption of a variety of constraints on capital development and costs, as well as checks on planning which may influence cost commitment. Among issues which the legislation has allegedly failed to address adequately are matters of accountability, organizational adequacy, and effective articulation and coordination of national health policy. The principle of delegating responsibility to voluntary agencies for disbursement of public funds is questioned, and reservation is expressed concerning the adequacy of regional organization as provided by the Act. Failure of the Act to incorporate a House planning bill to set up a national health policy is noted.

HRP-0009248/8GA Not available NTIS
Brookings Institution, Washington, D.C.
Medicare and the Utilization of Health Services by the Elderly.
Karen Davis, and Roger Reynolds. 1975, 17p
Pub. in Human Resources v10 n3 p361-77 Summer 75.

Descriptors: United States, Sociology, Socioeconomic status, Socioeconomic factors, Medical services, Health care, *Health care utilization, Health care facilities, Health care delivery, Financing, Demography, Communities.

An analysis of physician and hospital utilization patterns by the elderly is presented. The analysis focuses on the following considerations: extent to which Medicare has enabled the aged to seek medical care primarily on the basis of need; extent to which socioeconomic characteristics continue to affect utilization of health services by the elderly; and differential impact of socioeconomic factors by type of provider and service. An analysis of data from the 1969 Health Interview Survey confirmed that some inequities, especially by income, race, and geographical location, continue to occur in the utilization of health services by persons covered under Medicare. Payments per enrolled Medicare beneficiary were much higher for high income elderly persons than for low income elderly persons. Payments were also much higher for elderly whites than for elderly blacks, particularly in the south. The analysis did not reveal to what extent, if any, Medicare has reduced the income effect on demands for health services. It is evident, however, that equal payments by all covered persons result in lower expected utilization as income becomes smaller, except for those low income elderly persons also covered by Medicaid. It is also noted that, while other groups are generally not deprived of care on the basis of income, southern elderly blacks receive substantially less care than others. It is observed that Medicare reimbursement procedures, by basing allowed charges on those customary for an area, tend to reinforce existing medical manpower distribution patterns. Supporting data and details on techniques employed in the analysis are included.

HRP-0009337/7GA PC$5.00/MF$3.00
Government Studies and Systems, Inc., Philadelphia, Pa.
Reorganization of the Rhode Island Health Planning and Development System.
21 Jul 75, 87p

Descriptors: Systems, Strategy, *Rhode Island, Policies, Plans, Objectives, Methodology, Implementation, *Health planning, Health care delivery, Health care delivery systems, Guidelines, Development, Data acquisition.

The results of an analysis undertaken for the Rhode Island Department of Health of the organizational requirements for a statewide system for health planning and development, are presented. The analysis study was undertaken to combine and unify the functions and powers of both State and areawide agencies. The implementation of Rhode Island's Health Planning and Development System is discussed, with emphasis on the establishment of a statewide health planning and development structure and system through phased steps and resource requirements. Reasons are given for the recommended organization structure outlined for Rhode Island, and functions, operations, and relationships within Rhode Island's Planning and Development System are discussed. Appendices provide additional information on existing Rhode Island health planning and development activities, performance characteristics of State health planning and development functions, and a functional outline of responsibilities and task areas combining State and health system agency functions according to P.L. 93-641.

HRP-0009385/6GA PC$5.50
Ohio Commission on Nursing, Columbus.
Study of Nursing Needs and Resources.
Sep 75, 104p

Descriptors: Statistical distributions, Registered nurses, Ohio, *Nurses, *Health resources, Health occupations, *Health manpower, Health manpower education, Health education, Health care, Health care utilization, Health care requirements, Distribution, Demography, Communities.

The views of the Ohio Commission on Nursing concerning nursing and nursing education in Ohio as of 1975 are documented, and recommendations and plans of action for the development of Ohio's nursing resources through 1985 are presented. The report is the culmination of the efforts of three work groups which focused on preventive and maintenance care, acute care, and long-term care, respectively, and of a committee consisting of representatives from each group who studied nursing education and nursing research. The report includes narrative discussions, supported by tabular data and graphs, concerning utilization and distribution of nurses in Ohio, nursing education resources, and nursing research. Among the major recommendations stemming from the study are: (1) that the number of nurses prepared at the graduate level and working as teachers, supervisors, and administrators of nursing service, and clinical specialists increase from 1,100 in 1973 to 3,000 by 1985; (2) that by 1980 continuing education be a requirement for relicensure of any indivdual practicing nursing in Ohio; (3) that a State joint practice committee be established by 1976 to clarify the roles of and relationships between physicians and nurses and to provide direction for joint efforts at physician - nurse collaboration in extending health care services to the public; and (4) that by 1985 the basic nursing educational programs prepare two types of nurses whose roles are classified according to collection of facts, use of facts, technical and relationship skills, health guidance and teaching functions, direction and supervision, and types of clients cared for. Rationale for these and other recommendations are provided, as are plans of action relative to each recommendation. Data on nursing and nursing eduation, distribution of service and educational facilities, hospital nursing service directors, and nursing supply projections are appended. A glossary and list of references are provided.

HRP-0009412/8GA PC$5.00/MF$3.00
Michigan Univ., Ann Arbor.
First Six Years of Medicaid. A Selected Annotated Bibliography.
Victor R. Stoeffler, and Enid Errante Zwirn.
1971, 80p DHEW/SRS-72/24951

Descriptors: Sources, Methodology, *Health resources, Health care, Health care facilities, Health care delivery, Financing, Documents, Availability.

An annotated bibliography is provided which contains pertinent literature on the operation, accomplishments, and implications of Medicaid since its enactment in 1965. Preparation of the bibliography was cosponsored by the Medical Services Administration which administers the Federal share of the Medicaid program and by the Medical Assistance Advisory Council which is legislatively charged with advising the DHEW Secretary on matters related to Medicaid (Title XIX of the Social Security Act). It is felt that Medicaid has significantly altered the Federal Government's role in the delivery of health care and has provided experience which should be useful to future decisions affecting health care in the U.S. The bibliography on Medicaid is organized according to 10 major headings: (1) historical background; (2) health care delivery systems; (3) financing mechanisms for health care; (4) administration; (5) professional services and eligibility provisions; (6) utilization and utilization review; (7) public issues and public policy; (8) standards; (9) health care facilities; and (10) individual State programs. Within each category, bibliographic entries are organized chronologically and alphabetically by author.

HRP-0009415/1GA PC$5.00/MF$3.00
Moshman Associates, Inc., Bethesda, Md.
Impact and Epidemiology of Chronic Illness Among the Poor.
Final Rept.
30 Jun 75, 91p
Contract PHS-HRA-106-74-50

Descriptors: Sociology, Socioeconomic status, Socioeconomic factors, Methodology, Measurement, Health status, Health care, Demography, Communities.

The development of methodologies for investigating the epidemiology and impact of chronic illness among the poor is documented. Hypotheses and related methodological approaches are presented in the following five areas: (1) labor force participation and chronic illness, (2) health care resources and the chronically ill poor, (3) quality of care, (4) the new poor, and (5) nutrition and chronic health problems of the poor. The hypothesis concerning labor force participation and chronic illness is that chronic illness among the poor severely limits labor force participation and earnings potential. The second hypothesis states that the health care system allocates relatively fewer resources to chronic illness among the poor than is appropriate, given its incidence and severity. Relative to quality of care, it is hypothesized that the quality of medical care for the chronically ill poor is higher in comprehensive care settings than in solo practice or health delivery systems emphasizing episodic care (e.g., hospital outpatient departments). The fourth hypothesis surmises that individuals who have recently become poor for the first time as a result of national economic conditions will exhibit a higher incidence of illness and will utilize health care services more frequently than will comparable groups who have not become poor, and more frequently than those who have experienced poverty previously. It is further hypothesized that the longer individuals remain in the poverty status, the more severe their illness will become, the higher the incidence of chronic illness they will exhibit, and the more similar their illness and utilization patterns will become to those of the chronic poor. Survey and statistical approaches to establishing the verity of these hypotheses are noted; advantages, disadvantages, time frames, and potential costs and sources of data for each are cited. Although no hypothesis is set forth concerning nutrition and chronic health problems of the poor, an approach to reviewing the state of knowledge in the area of malnutrition is outlined.

HRP-0009646/1GA PC$8.00/MF$3.00
Health Planning Council of the Midlands, Omaha, Nebr.
Areawide Health Plan.
13 Dec 74, 245p
See also a companion document, HRP-0009647.

Descriptors: Systems, State regions, State government, Plans, Nebraska, Methodology, Local government, *Health planning, Health care delivery, Health care delivery systems, Development, Data acquisition.

The areawide health plan prepared by the Health Planning Council of the Midlands in Omaha, Nebraska is discussed. The plan was developed through the efforts of volunteers representing a cross-section of providers and consumers of health in an 11-county area. The formative stages of plan development identified existent community health agencies and programs. Plan development task forces related those health programs and services which are in operation to ideal conditions. It was then possible to identify strengths and weaknesses in the community health care system for the 11-county area in Nebraska and correlate identified problems with possible solutions. Each phase of development was reviewed by health agencies and organizations in the community. By following this method of development, the areawide health plan was broadly based so that all interested citizens had an opportunity to make a contribution. The plan addresses the following topics: education (coordinated health education, institutions, and health and long term educational costs); services (rural ambulatory care, rural preventive services, fragmentation of health services, environmental health, ambulatory care, availability and accessibility of care to the elderly, detoxification accessibility, treatment of drug problems, chemical dependency and alcoholism, home health care services, recuperative care services, and pharmaceutical services); data and studies on health and long term care services; potential problm areas in health care delivery; and standards and criteria for health services.

HRP-0009647/9GA PC$4.50/MF$3.00
Health Planning Council of the Midlands, Omaha, Nebr.
Areawide Health Plan. Plan Development Guidance Material.
1974, 53p
See also a companion document, HRP-0009646.

Descriptors: Systems, State regions, State government, Plans, Nebraska, Methodology, Local government, *Health planning, Health care delivery, *Health care delivery systems, Development, Data acquisition.

Purposes and scope of the areawide health plan developed by the Health Planning Council of the Midlands in Omaha, Nebraska are discussed. The areawide health plan is defined as a document that presents the desired health care system for a community and recommends specific actions to ensure that the desired system is attained. The plan contains specific statements that direct the development of a community's health care system. It is pointed out that the areawide health plan must be based on realistic expectations and that it must be continuously revised and updated. Three objectives of the plan are identified: (1) describe the desired health care system for communities in an 11-county area of Nebraska; (2) note deficiencies and gaps in the health care system; and (3) provide planning guidelines for decisions and actions designed to enhance the health care system. Content of the areawide health plan is related to the desired health system, status of the system, and recommendations for improvement. The process involved in developing the plan is detailed along with the role of participants in such development. Plan development guidance material is provided, and phases of plan development are delineated. Appendices provide additional information on planning terminology, standards, and format protocols for an ideal health care system.

HRP-0009659/4GA PC$4.00/MF$3.00
Temple Univ., Philadelphia, Pa.
Effects of Cost-Sharing in the Medicaid Program.
Final Rept.
Charles P. Hall, Michael L. Dolfman, Jerry S. Rosenbloom, William H. Wandel, and Robert D. Eilers. Dec 73, 40p
Grant SRS-18-56651

Descriptors: State regions, Prepaid health care, Physicians, Pennsylvania, Methodology, Measurement, *Health resources, Health insurance, Health care, Health care utilization, Health care facilities, Health care delivery, Financing.

Findings are reported of a study undertaken to determine the impact of various cost-sharing mechanisms on the utilization of health care services by the poor. Objectives of the study included a review of the literature on cost-sharing, a determination of potentially valuable areas for short-term and long-term study, a study of Philadelphia service providers' reactions to cost-sharing, and a study of administrative costs attendant to various cost-sharing mechanisms. Due to a lack of cost data from third parties, the final portion of the study was not consummated. A general lack of information on cost-sharing mechanisms, as well as a lack of consensus as to the primary goal of cost-sharing (i.e., reduction of unnecessary utilization versus reduction of program costs), are noted. The report focuses on the more common economic incentives invoked to control the distribution and / or the cost of health care services to consumers. Typically, these include the following cost-sharing arrangements: deductibles, coinsurance or percentage participation, copayment, and maximum limits on benefits. The survey of 1,200 out of approximately 2,000 physicians (42 percent response) in Philadelphia and 352 osteopaths (46 percent response) revealed that one-half of the physicians delivering primary care in that area could be expected to cooperate with cost-sharing provisions if such provisions were introduced into the Medicaid program. The deductible type of cost-sharing provision would be likely to elicit the most physician cooperation, while coinsurance would elicit the least. Findings of other studies dealing with hospital utilization patterns and removal of deductibles, physicians' services to the poor, and cost-sharing in Europe are summarized. The study of the impact of Medicare and Medicaid on hospital utilization patterns in Philadelphia indicates that changes in utilization practice by low income and elderly patients were due to the fact that these patients were 'captured' by institutions in search of additional revenue. Due to the observed lack of information, no recommendations on implementation of cost-sharing are offered.

HRP-0009664/4GA PC$7.75/MF$3.00
Urban Inst., Washington, D.C.
Health Start: Final Report of the Evaluation of the First Year Program.
Leona M. Vogt, and Joseph S. Wholey. 29 Sep 72, 213p

Descriptors: United States, Sociology, Socioeconomic status, Socioeconomic factors, Research and development, Projects, Health care, *Health care delivery, Demography, Communities.

An evaluation of the first program year of the Health Start project is documented. Health Start represents an attempt by the Office of Child Development, DHEW to build on the health experience gained in the Head Start program to learn more about methods of ensuring delivery of health services to economically disadvantaged preschool children. Health Start served over 10,000 children at some 29 project sites during the first year (1971-1972). Of those, approximately 48 percent were white, 27 percent black, 18 percent Spanish-surnamed, two percent Puerto Rican, and two percent Indian. About eight percent of Health Start children were migrants. Of the total number of children enrolled in Health Start in the first year, 78 percent received medical examinations and 42 percent received dental examinations. Of those tested, 24 percent needed medical treatment and 56 percent of those needing treatment received it. Of those receiving dental exams, 44 percent needed treatment; of those needing treatment 38 percent completed treatment. Costs per child for the total program, health services, and personnel varied greatly, and only a slight correlation was identified between costs and health services provided. The evaluation effort involved program monitoring, study design, and evaluation research components. Projects site visits were made to obtain data on local background, planning processes, service delivery, follow-up, use of consultants, organizational structure, use of grant funds, health education, staff background, and parent participation. Evaluation methodology and findings are described in detail, and the progress of the Health Start program toward meeting its objectives is assessed. Extensive tabular data and other documentation accom-

pany the report. Portions of this document are not fully legible.

HRP-0009678/2GA PC$5.50/MF$3.00
Mariscal and Co., Los Angeles, Calif.
Consumer Board Training and Technical Assistance to Migrant Health Projects in the Southwest and Far West Regions of the United States.
Final Rept.
Jul 74, 105p
Contract PHS-HSM-110-73-483

Descriptors: Regions(United States), Personnel management, Participative management, Orientation(Training), Montana, Methodology, Management methods, Local government, Health related organizations, Health planning agencies, Health education, Consumers, Community relations, Colorado, California, Arizona.

A 12-month training and technical assistance program, undertaken to assist migrant workers in DHEW Regions VIII and IX (the Southwest and Far West) in becoming effective members of the policy-making boards serving migrant health projects, is documented. Initial training, follow-up training, and technical assistance were provided to ten migrant health projects in four States. The projects chosen already had achieved some degree of sophistication in the policy-making process. The report presents an overview of the activities, accomplishments, and suggestions generated by the training and technical assistance effort. The initial training sessions utilized two curriculum components, one dealing with the role of the consumer board, with emphasis on the role of board members as policy-makers and of project staff as policy - implementors, and another dealing with the planning process. Services provided in follow-up sessions and in technical assistance programs varied from site to site. A list of technical assistance services offered at each site is included, as are individual profiles for each of the project sites. Profiles include a description of training activities and evaluations of the strengths and weaknesses of health projects, developed by the trainees. Inconsistency in attendance and major differences in levels of sophistication between boards are cited as factors limiting the effectiveness of training. The bilingual nature of the training session and their seminar structure are described as beneficial factors.

HRP-0009668/1GA Not available NTIS
American Psychiatric Association, Washington, D.C.
Present and Future Importance of Patterns of Private Psychiatric Practice in the Delivery of Mental Health Services.
Task Force Rept.
Jun 73, 36p
Available from the American Psychiatric Association, 1700 18th St. N.W., Washington, D.C. 20009, $2.35.

Descriptors: United States, Physicians, *Mental health care, Medical personnel, *Health resources, Health related individuals, Health occupations, Health manpower, Health care services.

The role of the private practice psychiatrist in the delivery of mental health services in the U.S. is examined in the sixth of a series of American Psychiatric Association monographs. Characteristics of adequate psychiatric services are delineated, and various patterns of private practice are identified. Settings of psychiatric practice (private offices, community general hospitals, private psychiatric hospitals, university hospitals, group practices, health maintenance organizations, and medical corporations and partnerships) are described. Findings of an analysis of the contribution of private practicing psychiatrists to the delivery of mental health services in Kentucky are summarized. The study findings indicate that the private practice segment of the profession in Kentucky is the largest component of the State's mental health delivery system, and that private practitioners and mental health centers serve two different needs. Based on data from the Kentucky study and other sources, aspects of the economics of private practice in psychiatry are discussed. An evaluation of factors in private practice delivery systems leads to the conclusion that, except for the fact that private practice does not meet the need of certain segments of the population, private practitioners do meet a large proportion of the health needs of the American people and should be viewed as performing a public service. The impact of third-party payment on the private practice of psychiatry is examined, and conclusions are offered concerning the appropriate involvement of the American Psychiatric Association in supporting private practice.

HRP-0009743/6GA Not available NTIS
Yale-New Haven Hospital, Conn.
Unit Management Evaluation.
Thomas B. Condon. 1974, 3p
Pub. in Hospitals, Jnl. of the American Hospital Association v48 p61, 62, 64 16 Nov 74.

Descriptors: State regions, Research, *Nurses, Health occupations, Health manpower, *Health care utilization, Health care delivery, Connecticut.

The unit management program, undertaken at Yale-New Haven (Connecticut) Hospital to provide administrative support to the nursing staff on patient care divisions, is evaluated. The unit management department is charged with five major responsibilities usually assumed by the head nurse: service coordination, patient assistance, maintenance of supply and equipment standards, secretarial management, and budgetary monitoring. The 1972 evaluation explores the impact of the unit manager on the operational environment of a patient care division in terms of the functional activities. Data were gathered from two patient care units, one served by a unit manager and one administered in the traditional manner. Functional areas of activity monitored are classified as patient - centered, personnel - centered, unit - centered, and other - centered. Attitudinal questionnaires were distributed to patients, nursing floor staff, and ancillary personnel before and five months after assignment of the unit manager to the study unit. During the course of the study, total floor staff participation in unit - centered activities in the study unit decreased by 14.8 percent, and total floor participation in patient - centered activities increased by 15.1 percent. The bulk of these shifts is attributed to the influence of the unit manager, whose efforts were centered on unit - related activities. Floor staff and ancillary personnel assigned to the study unit perceived an increased efficiency in floor performance. The study findings affirm the positive impact that a unit manager can have on a patient care division. Supporting data are included.

HRP-0009745/1GA Not available NTIS
California Univ. Medical Center, San Francisco.
Critical Issues in the Use of Physician Associates and Assistants.
T. Elaine Adamson. Jul 71, 15p
Pub. in American Jnl. of Public Health v61 p1765-1779 Sep 71.

Descriptors: Physician extenders, *Physician assistants, *Health resources, Health occupations, Health manpower, Health manpower education, Health education, Health care utilization.

Issues surrounding the delegation of physician tasks to physicians' associates and physicians' assistants are explored. Physicians' associates are health workers educated to the level where they can make some independent judgments as well as carry out tasks in health counseling. Physicians' assistants are less educated and less independent than associates. They carry out tasks that are specifically delegated to them, such as collecting information about patients and presenting it to the physician. Studies are cited in which nurse practitioners and other physicians' associates and physicians' assistants have proved valuable in increasing the productivity of a medical care delivery unit. Legal issues involving the tasks that associates and assistants may perform, together with those specifying responsibility or liability for suit by a patient for actual or supposed injury, are discussed. It is noted that the legal issues partially reflect the conflict within the health care field concerning the use of auxiliary personnel, which in turn creates uncertainties in associate and assistant training programs, several of which are described briefly. Conflict over training programs is said to suggest that the main factor affecting productivity in associate or assistant utilization is the reluctance of many physicians to accept the roles of assistants and especially of associates. Indications of quality of care delivered by assistants and associates, possible future directions for these manpower categories, and consumer acceptance of the new professionals in different types of communities are discussed. It is suggested that one means of facilitating physician acceptance of the new roles and of building mutual trust would be to train assistants and associates with medical students in team situations.

HRP-0009748/5GA Not available NTIS
Montana Deaconess Hospital, Great Falls.
Charging by Level of Nursing Care.
Fred K. Holbrook. Aug 72, 4p
Pub. in Hospitals, Jnl. of the American Hospital Association v46 p80, 84, 86, 88 Aug 72.

Descriptors: State regions, Projects, Patients, Montana, Inpatients, Health manpower, Health care utilization, Health care delivery, *Health care costs, Acute care.

The application of an absolute cost / charge concept to the nursing units of Montana Deaconess Hospital, Great Falls, Montana is described. The specific billing system separates room charges from food and nursing care charges, room charges being based on specific related costs and prorated expenses from non-revenue - producing departments. All food service is handled on a per-meal charging basis, and patients are charged only for the food they order. Separate charges for other supplies and services are also based on actual costs, which are computer-analyzed quarterly from inventory status records. Before the level of nursing care aspect of the specific billing system was initiated, an hourly charge was made for general nursing care, with a higher charge being made for patients receiving intensive care. The hospital initiated a cost / charge relationship study for all revenue-producing departments, with special emphasis on nursing units. The level of nursing care program that evolved from the study includes evaluation of patient status, relating of staffing and patient charges to patient status, and centralized nursing unit scheduling, with related assignment of all internal costs. The system is based on four classifications of nursing care: routine, moderate, special, and intensive. The level of nursing care program is of significant value in management control, scheduling nursing personnel where they are needed when they are needed. The system has also allowed initiation of progressive patient care concepts with much less patient movement. An additional bonus has been the system's use with insurance claims. Personnel have adjusted to the module staffing concept of the program, which has proved suf-

ficiently flexible to accommodate staff needs. Details of the system in operation are provided, together with definitions of the levels of care.

HRP-0009749/3GA Not available NTIS
Nurse Autonomy and Accountability in Organized Nursing Services.
Meridean L. Maas. 1973, 23p
Pub. in Nursing Forum v12 n3 p237-259 1973.

Descriptors: State regions, Registered nurses, Policies, Personnel development, Objectives, *Nurses, Methodology, Iowa, *Health resources, Health planning, Health manpower, Health manpower education, Health education, Guidelines.

Professional nurse autonomy and accountability as means for improving patient care are analyzed theoretically. Autonomy is defined as the right of self-determination and governance without outside control; professional autonomy means that practitioners are self-regulating and have control over their functions in the work situation. Accountability means responsibility to authority for one's actions. The accountable individual is prepared to explain and to receive credit or blame for the results of his actions. For the professional, accountability for behavior coexists with autonomy. It is noted that one of the major constraints to the development of professional nurse practice has been the status of most nurses employed in bureaucratic organizations. Typically, nurses employed in a hospital department within an institutional hierarchy have been delegated administrative authority and accountability, but have not been granted responsibility for their own patients over an expanded period of time. It is further noted that nurses traditionally have not shown a propensity for seizing professional authority and accountability. Development of organizational circumstances compatible with professional nurse autonomy and accountability at the Iowa Soldier's Home is described. In this setting, nurses have been major instruments of changes that have taken place since 1965. As primary advocates for the residents, nurses have sought ways to improve care and, as providers of the primary service at the institution, have determined the level of care. The model and planning steps used by the Iowa Home nurses in establishing their autonomy and accountability within a bureaucratic institution are described.

HRP-0009750/1GA Not available NTIS
Primary Nursing: Evaluation.
Karen L. Ciske. 1974, 3p
Pub. in American Jnl. of Nursing v74 n8 p1436-1438 Aug 74.

Descriptors: Quality assurance, Projects, *Nurses, Methodology, Measurement, Health occupations, Health manpower, Health care, Health care utilization, Health care delivery.

The experience of a primary nursing project at a university hospital is recounted, and the findings of a patient opinion survey concerning the primary nursing mode of care delivery are reported and discussed. With the exception of nursing assistants, staff turnover rates were found to be noticeably lower in nursing units that had adopted the primary nursing system than in units utilizing team nursing. Primary nursing staff members assume responsibility for care planning for three to four patients. Questionnaires were mailed to 200 patients discharged from two primary nursing units and two team nursing units, all staffed by young nurses, many in their first positions since graduation. Problems arose from the study design because many of the patients could not recall the unit in which they had stayed and questionnaires were not coded to allow for such identification. Where units were identified, patients from primary nursing units reported that nurses encouraged communication concerning patient complaints or problems significantly more often than was mentioned by patients from team nursing units. Although this difference was the only statistically significant one, responses to other questions suggest areas for further investigation. Shortcomings of the survey method are pointed out. It is concluded, nevertheless, that consumer participation in health care evaluation is of value.

HRP-0009751/9GA Not available NTIS
Pittsburgh Univ., Pa. Univ. Science Center.
Model for Determining Turnover Costs.
John Hunter Dane. 16 May 72, 5p
Pub. in Hospitals, Jnl. of the American Hospital Association v46 p65-69 16 May 72.

Descriptors: Utilization, Nurses, Methodology, Health care, Health care facilities, *Health care costs, Data processing, Data analysis.

A model is presented which converts labor turnover statistics into dollar equivalents that reflect losses or costs per hospital department or job classification. The model development study identified each step in the replacement process for each of six groups of hospital workers: registered nurse, licensed practical nurse, nursing aide, dietary worker, housekeeper, and custodian. Shortcomings of other methods (i.e., averaging costs and not identifying costly steps in the employment procedure) are overcome by assigning departmental costs to each step of the employment process for 'equivalent' weighted hirees. In the hospital studied, turnover rates for 1969 were 84 percent in dietary, 85 percent in housekeeping, and 57 percent in nursing services. The hospital experienced 551 turnovers and a dollar loss in excess of $350,000, which represents 1.6 percent of the hospital's $22 million budget. The following recommendations are offered: (1) that hospitals develop a data system to provide management with continual employee cost and turnover statistics; (2) that management contact former employees who are short-term departures and request that they consider reemployment, in an attempt to gain a savings over the cost of training newly hired personnel; (3) that the hospital take steps to ensure a healthy working environment and to identify sources of employee dissatisfaction; and (4) that the responsibility for educating nursing aides be shifted from hospitals to educational institutions. Supporting data are included.

HRP-0009752/7GA Not available NTIS
Saint Bernard's Hospital, Jonesboro, Ark.
Stratification of Nursing Services and Costs.
H. C. Knowlton, and Michael D. Dunn. 1970, 4p
Pub. in Hospital Progress p34-36, 46 Jan 71.

Descriptors: State regions, Research, Patients, Nurses, Inpatients, Health occupations, Health care delivery, *Health care costs, Arkansas, Acute care.

A study is reported of patient nursing care undertaken at St. Bernard's Hospital, Jonesboro, Arkansas as part of an approach to cost containment. During the study, all nursing care activities were defined in detail and were categorized as to: care type (direct, indirect, clerical, supervisory, and educational); level of demand upon the nurse's time (rigid, semi-rigid, discretionary, desirable, and administrative); reasonable expectancy (the reasonable expected time required to perform an activity, based on observation); skill goal (the hospital's skill expectancy for the person performing a given activity); and unit of measure (an objective measurement of the frequency of occurrence of a given activity). A volume study was conducted to determine the frequency of occurrence of each activity by volume, hour of day, skill level of nurse performing the activity, and type of patient receiving the service. A patient classification system, which evaluates each patient on three levels of care in each of five categories of dependency on nursing service, was developed as a means of classifying patients according to the amount of time needed to render nursing care. Depending on the level of care at which a patient is designated in each of the five categories, the patient receives points which modify the general cost of care according to his own nursing care needs. Although imperfect, the system represents a first step toward rationalizing the cost of health care provided at St. Bernard's.

HRP-0009757/6GA Not available NTIS
Health Care Management Corp., Pittston Township, Pa.
Survey of Health Care. A Report on Northeastern Pennsylvania.
1974, 26p
Contract PHS-HSM-110-71-234
Available from the Health Care Management Corp., 1011 Oak St., Pittston Township, Pa. 18640, $1.00.

Descriptors: Statistical distributions, State regions, Research, Pennsylvania, Patients, Medical services, Inpatients, Health status indexes, Health statistics, Health resources, Health care, Health care utilization, Health care indexes, Health care facilities, Health care delivery, Demography, Data, Communities, Acute care.

Findings are reported of a survey of 1,607 families in northeastern Pennsylvania, undertaken to develop a health care profile for the eight-county region. Information is presented on the demographics of the area, the general health of the population surveyed, disability days, primary care utilization, medical care patterns, hospital utilization, attitudes toward the health care system, and health care expenditures. The results indicate that the large proportion of elderly persons in the region greatly influences utilization of the health care system. More disability days are claimed by this age group, relatively more are victims of chronic disease than in the U.S. as a whole, and there are more physician contacts and days in the hospital than with any other age group. The study findings indicate that the elderly use the health care system inadequately, or that the system discourages efficient use by the elderly. In terms of planning for the future, it is suggested that greater emphasis be placed on the role of the elderly within the health care system. Distribution of physicians in northeastern Pennsylvania was found to contribute to problems of patient overload. One-third of the persons in the region are classified as rural residents, but only 20 percent of the total number of physicians are located in rural areas. Chronic disease is a major problem in the area, affecting twice as many people than the national average. This finding would indicate a possible need for increased numbers of long-term care hospital beds as well as for clinics oriented to diagnosis and outpatient treatment. A comprehensive health plan is recommended for the area. Supporting graphic and tabular data are provided.

HRP-0009957/2GA PC$13.00/MF$3.00
Utah Dept. of Social Services, Salt Lake City. Office of Comprehensive Health Planning.
Comprehensive Health Plan for Utah. Volume 1: Selected Health Problems, Health Goals, Objectives and Priorities.
Nov 75, 535p

Descriptors: *Utah, Systems, State government, Research, Plans, Methodology, Local government, *Health planning, Health occupations, Health care delivery, Health care delivery systems, Development, Data acquisition.

Health problems in Utah are addressed in Volume I of the State's comprehensive health

plan. Attention is focused on the general health delivery system in Utah, target groups, and personal health problems. Specific time-oriented objectives are presented for improving health conditions, and priorities are outlined to develop a consensus upon which resource allocation can be based. The impact of health problem evaluation on Utah's health delivery system and on health planning is assessed. Activities and objectives which will be undertaken as a result of the State's perceived health problems are delineated. Health delivery system problems are related to community health resource development guidelines, consumer information and referral, emergency medical services, environmental health, health education, health information systems, health maintenance organizations, national health insurance, preventive health care, Utah's professional review organization, legislation and health policy, manpower, services and facilities, and transportation. Target groups of comprehensive health planning are identified as abused children, elderly, high risk pregnant women, Indians, migrants, and rural populations. Specific personal health problems are concerned with accidents, alcoholism and drug abuse, communicable diseases, dental health, mental health and suicides, noncommunicable chronic diseases, physical and mental handicaps, and unwanted pregnancies. The role of Utah's comprehensive health plan in local health planning is examined, and private sector input to the plan is noted. Appendices provide supporting information on health problems in Utah.

HRP-0009961/4GA Not available NTIS
Butler County Memorial Hospital, Pa. School of Nursing.
Role and Identity: An Important Distinction.
Mary Steen Hartwig. Oct 72, 5p
Pub. in Nursing Outlook v20 n10 p665-669 Oct 72.

Descriptors: United States, Registered nurses, Personnel development, *Nurses, Health occupations, *Health manpower education, Health education, Foreign countries.

The distinction between role and identity in nursing is discussed in the context of the emphasis in nursing education on provision for upward mobility. The nurse's role is defined as what the nurse actually does. The nurse's identity, however, is seen as the ability to examine the foundations on which one's practice is based, i.e., the ability to evaluate nursing practice in the light of existing theory and new knowledge. It is suggested that, while a technical nurse may in some instances assume a professional nurse's role, the technical nurse cannot assume the professional nurse's identity. The development of two major nursing programs in Kenya, a professional education program for registered nurses and a technical training program for enrolled nurses, is described. In the registered nurse schools, education is aimed at maintaining internationally accepted standards, with the expectation that numbers will increase as more young people have access to and complete secondary education. Enrolled nurse pupils, on the other hand, are recruited on the basis of demand for their services, and standards are established according to changes in standards of general education. The two levels of nursing education in Kenya are based on the recognized need to produce large numbers of skilled technical nurses quickly, while at the same time preparing other nurses with a strong academic background and greater breadth and depth of clinical and interpersonal skills. The need for continuing education among the technical group is recognized, but is not directed toward mobility into the registered nurse category. Anecdotes drawn from observations of nursing practice in Kenya indicate the need for distinction between identity and role in nursing. The validity of the career ladder concept for nursing is questioned.

HRP-0009967/1GA Not available NTIS
Wisconsin Univ., Madison.
Descriptive Model of Nursing Care.
Gerald Nadler, and Vinod Sahney. 1968, 6p
Pub. in American Jnl. of Nursing v69 n2 p336-341 Feb 69.

Descriptors: Wisconsin, System analysis, State regions, Quality assurance, Methodology, Measurement, Health care, Data processing, Data analysis.

A project undertaken by the Industrial Engineering Division at the University of Wisconsin Hospital to identify factors affecting the quality of patient care is described, with emphasis on the creation of a nursing care model for use in measuring the quality of nursing services. The overall project is based on a specific descriptive model called a system pyramid, in which brief descriptions representing each factor contributing to quality of patient care are arranged in the form of a pyramid. Two variations of the nursing portion of the model are considered. The first subdivides nursing care into sublevels of satisfying physicians orders, clinical care under nurses' direction, and psychologic care. A second approach focuses on factors which, when measured, determine how well the needs of the patient are met. In this approach, nursing service diagnosis is subdivided into agreement of patient to be assisted, securing and selection of data, state and availability of art and science, and state of proficiency of the practitioner. In both approaches, continued subdivisions would likely contain all factors in the nursing model described. The model of nursing care illustrated provides a framework on which to develop factor measurements for assessing quality. Taken as a whole, the system pyramid provides a sentence description of specific factors pertaining to the quality of patient care. These sentences specify the factors which must be measured to arrive at a final measure of quality. Schematic diagrams of the system pyramid and of its nursing service component are provided.

HRP-0009968/7GA Not available NTIS
Bronx Municipal Hospital Center, N.Y.
Nursing Care Audit - A Tool for Peer Review.
Florence Corn, and Kathleen Magill. 1973, 5p
Pub. in Supervisor Nurse p20-21, 23, 26, 28 Feb 74.

Descriptors: State regions, Reviewing, Quality assurance, Peer groups, Nurses, New York, Methodology, Measurement, Health occupations, Health care.

The development and implementation of a nursing care audit procedure for the Department of Nursing at Bronx Municipal Hospital Center, New York City, are described. Although developed for a 1200-bed hospital, the audit can be adapted for use in smaller facilities. A committee of head nurses and supervisors from all services devoted a year to surveying literature, formulating objectives, developing tools and methodology, piloting the audit project, and revising forms and procedures. The decision was reached to audit not only the patient's chart, but also the patient himself, the nursing care plan, and the unit assignment sheet. A patient interview guide was later added for use in assessing patient satisfaction and in teaching. Audits are conducted at random by teams of three, including the nursing supervisor or clinician, who acts as team leader, the nurse in charge of the unit being audited, and a registered nurse from a separate but similar unit. Audits are done monthly by personnel on all tours and on all units. Area - specific audit standards have been developed in specialty units. Completed audits are reviewed by appropriate supervisors and unit staff. A patient - centered conference is attended by all nursing personnel on the unit and is regarded as a vital part of the audit. Audit results are revised by the improvement of Patient Care Committee, which uses the results to identify nursing service strengths and weaknesses. Since implementation of the audit procedure, progress has been noted in the administration of care and in the writing of care plans and assignments. The audit offers staff criteria needed for evaluation of care. Samples of audit forms are provided.

HRP-0009970/5GA Not available NTIS
Cornell Univ.-New York Hospital School of Nursing.
Perspective on the Physician's Assistant.
Eleanor C. Lambersen. 1971, 5p
Pub. in Nursing Outlook v20 n1 p32-36 Jan 72.

Descriptors: Registered nurses, Physician extenders, *Physician assistants, Nurses, Job analysis, Health resources, Health occupations, Health manpower.

The concept of the physician's assistant (PA) and the potential conflict in role definition between the nurse and the PA are discussed. It is suggested that the issue to be resolved is not that the PA is a replacement for the nurse, but that there exist gaps and priorities in health services that require extension of nursing into areas considered the province of medicine and that require additional support personnel for the physician. Toward clarification of the roles of nurses and PAs, several definitions are noted. The PA is defined as a skilled person qualified by academic and practical training to provide patient services under the supervision and direction of a licensed physician who is responsible for the performance of that assistant. The generalist assistant is distinguished by his ability to interpret findings on the basis of general medical knowledge and to exercise a degree of independent judgment, while the specialist assistant is prepared in one clinical specialty or in certain procedures within the specialty. One definition views the profession of nursing as diagnosing and treating human responses to actual or potential health problems through such services as case finding, health teaching, health counseling, provision of care supportive to or restorative of life and well-being. Pediatric nurse practitioners and nurse midwives are among nurse practitioners demonstrating competence as physician extenders. It is suggested that nurses in extended roles are crucial to the delivery of health care to all citizens, but that this does not negate the significance of other existing health personnel or the need for new types of personnel. However, it is suggested, the emphasis for all health workers must be that of continuous and critical appraisal of traditional roles, free from 'territorial disputes.'

HRP-0009983/8GA Not available NTIS
Chicago Univ. Hospitals and Clinics, Ill.
Analysis of Trends in Nursing Care Management.
Barbara J. Stevens. 1972, 6p
Pub. in Jnl. of Nursing Administration p12-17 Nov-Dec 72.

Descriptors: Quality assurance, Methodology, Measurement.

Two approaches to nursing care measurement, task analysis and quality control, are contrasted, with the emphasis on development of a quality control system. The basic premise is that all measurement in nursing care should start with a quality control base, one which involves standards, surveillance, and corrective action. The strengths and weaknesses of the task analysis approach are pointed out. The quality control approach is described as involv-

ing identification of desired nursing practice criteria, establishment of a system for comparing actual nursing practice to these criteria, and use of process standards rather than structure standards. Steps involved in establishing such a quality control system for nursing care are outlined, and factors that influence the quality control system are discussed. Uses of quality control output as a diagnostic tool, as a basis for calculating nursing personnel needs, and as a means of identifying particularly productive nursing teams point out the advantages of a quality control - based system over a task analysis approach. The aim of the task analysis system is fair distribution of nursing tasks, while that of the quality control system is evaluation of the quality of care. Task analysis is based on what is currently being done, while quality control considers what ought to be done. Task analysis views nursing as a series of specific tasks and points out instances when a team produces fewer completed tasks than the norm. Quality control views nursing as a process and points out instances of exceptional nursing, both good and bad. The perspective of task analysis is what happens in the care delivery system, while that of quality control is what happens to the patient.

HRP-0010834/0GA PC$4.50/MF$3.00
Farabee Associates, Lexington, Ky.
Institute on the Future of Long-Term Care in the United States.
Preliminary Rept.
Lillian Press. 12 Jun 76, 66p

Descriptors: Policies, Patients, Objectives, Methodology, *Long term care, Inpatients, *Health planning, Health care services, Guidelines.

Issues involved in planning, programming, and legislating for long-term care in the United States are presented and discussed in a document intended to stimulate discussion of these issues among participants in the National Conference of Social Welfare's 103rd Annual Forum held in Washington, D.C. in June 1976. The report provides a brief history of long-term care in the U.S., an outline of dilemmas in the area of long-term care, a theoretical exploration of elements and principles, suggested strategies for improving long-term care, and discussions of financing and legislation. The dilemmas cited concern: (1) placing administrative authority for long-term care; (2) changing traditional attitudes of professional staffs; (3) changing public and community value systems; (4) developing funding capability and funding patterns to enable a continuum of long-term care; (5) establishing a format that will value the commitment to guaranteed rights of individuals, recognize society's concern for the vulnerable, and protect the safety of the community; (6) retaining and shoring up the informal support systems; and (7) determining whether an intermediary system, involving the performance of specific tasks, can provide resolution to other dilemmas. The pro's and con's of several hypotheses regarding the placement of administrative authority for long-term care are pointed out. Principles for long-term care are discussed relative to the design of a long-term care system, regulation of such a system, citizen participation, and professional ethics. Strategies are suggested for informing citizens, planning resources, and delivering services.

HRP-0010838/1GA Not available NTIS
Florida Univ., Gainesville.
Health of a Rural County. Perspectives and Problems.
Richard C. Reynolds, Alice H. Murphree, and Sam A. Banks. 1976, 203p
Available from University Presses of Florida, 15 NW 15th St., Gainesville, Fla. 32601.

Descriptors: State regions, Sociology, Socioeconomic status, Socioeconomic factors, *Rural health services, Rural areas, Physicians, Health occupations, Health manpower education, Health education, Health care, Health care services, Florida, Demography, Communities.

The successful establishment of a community health program in rural Lafayette County, Florida by the University of Florida Medical and Nursing Schools is described. Not only has the Lafayette County Health Center provided better and more accessible health services to rural residents, it has also added a significant dimension to medical and nursing education at the University. The distinctive aspects of a rural society and the effect of these sociocultural characteristics on citizens' health and health care are reviewed. Following this general discussion, a portrait of Lafayette County is drawn, including a description of health care facilities and health-seeking patterns. The results of research conducted at the university-sponsored rural health center are discussed and comprise a profile of examinations conducted, symptoms described, diagnoses obtained, and medication prescribed. The planning and development of the health center are described, and the effects of recent developments on rural health care problems are explored. Several studies conducted at the center concerning health care attitudes of the resident population are reviewed. The impact of such rural medical and nursing education programs on traditional teaching is examined and the advantages of such education are considered.

HRP-0010867/0GA PC$7.50/MF$3.00
Colorado Dept. of Health, Denver. Div. of Comprehensive Health Planning.
State of Colorado. Health Systems Plan Framework.
17 Dec 75, 178p
See also Chapter 6, HRP-0010868.

Descriptors: Systems, State government, Reviewing, Plans, Methodology, Local government, Legislation, Law(Jurisprudence), *Health planning, Health care, Health care requirements, Health care facilities, Health care delivery, *Health care delivery systems, Evaluation, Development, Data acquisition, *Colorado, Certification, Assessments.

The health systems plan framework developed by Colorado's Department of Health is described. Two major objectives of Colorado's health systems plan are delineated: (1) facilitate the identification of problems and needs in the health system in Colorado; and (2) provide a base in the conduct of review activities for capital expenditure proposals (Section 1122 of the Social Security Amendments and the State Certificate of Need law) and for local, State, or Federal plans and policies affecting the health care delivery system in Colorado. An overview of the health system is provided, and the health services component of the system is discussed. Primary services are identified as acute ambulatory care, preventive and maintenance care, referral services, and emergency medical services. Intermediate services include general hospital acute inpatient services, long term nursing care, hospital-based support services, alcohol abuse, convalescent services, drug abuse, facilities for the mentally retarded and developmentally disabled, geriatric services, home health services, mental health services, outpatient surgery centers, rehabilitation, and residential care services. Specialized services are noted as computerized axial tomography, end stage renal disease services, radiation therapy, high risk perinatal care, burn care, cardiac surgery, blood banking and processing, cardiac catheterization, newly developed equipment, special laboratory services, and neurotrauma centers. Other components of the health system are discussed which involve manpower, financing, education, planning, quality control, system monitoring, and governmental controls. Provisions of the annual implementation plan for Colorado's health systems plan are outlined.

HRP-0010868/0GA PC$4.50/MF$3.00
Colorado Dept. of Health, Denver. Div. of Comprehensive Health Planning.
State of Colorado. State Annual Implementation Plan - 1976. Chapter VI of Colorado's Health Systems Plan Framework.
22 Jan 76, 57p
See also a companion document, including chapters 1-4, HRP-0010867.

Descriptors: Systems, State government, Reviewing, Plans, Methodology, Local government, Legislation, Law(Jurisprudence), *Health planning, Health care, Health care requirements, Health care facilities, Health care delivery, *Health care delivery systems, Evaluation, Development, Data acquisition, *Colorado, Certification, Assessments.

The 1976 health implementation plan within Colorado's health systems plan framework is discussed. The primary objective of the health systems plan framework is to provide a base for the conduct of review activities pertaining to capital expenditure proposals (Section 1122 of the Social Security Amendments and the State Certificate of Need law). The major purpose of the implementation plan is to summarize the health systems plan framework and make it a more workable document. The annual implementation plan for 1976 lists goals and short term implementation recommendations for various health services and establishes priorities for action among these recommendations. The following priorities are identified for 1976: general hospital acute inpatient services, computerized axial tomography, high risk perinatal care, and burn care. In 1977, emphasis will be placed upon emergency medical services, long term nursing care, specialized cardiac surgery, dental care, and home health services. Major problems that may affect the implementation of recommendations and further plan development are identified. Appendices provide background information on the development of Colorado's health plan framework and activities of the Colorado Division of Comprehensive Health Planning.

HRP-0011343/1GA Not available NTIS
American Nurses' Association, Inc., Kansas City, Mo.
Staffing: A Journal of Nursing Administration Reader.
Mary Ellen Warstler. 1974, 62p
This document consists of ten articles by different authors.
Available from the American Jnl. of Nursing Co., 10 Columbus Circle, New York, N.Y. 10019.

Descriptors: *Nurses, Health occupations, Health manpower, *Health care utilization.

Ten articles dealing with the concepts and mechanisms of staffing are compiled as an aid to nursing administrators. Topics covered are: (1) primary nursing as an organization that promotes promotional practice; (2) staffing for quality care; (3) management techniques for nursing service administrators; (4) cyclic work schedules and a non-nurse coordinator of staffing; (5) the reconstructed work week as an answer to scheduling dilemmas; (6) clinical staffing with a 10-hour day, four-day work week; (7) community nursing administration and the quantification of nursing utilization; (8) satisfaction of job factors for registered nurses; (9) job satisfaction and float assignments; and (10) maintaining the job performance of the aging employee. The article on staffing for quality care contains a categorization of the nursing care needs of patients; sample forms

for 24-hour patient, area, and nursing service reports; and a sample chart for daily staff assignments. Sample forms also accompany the article describing cyclic work schedules, a technique that provides every other weekend off for nursing service employees while supplying full hospital care seven days per week. The article on the reconstructed work week describes a scheduling technique whereby the length of each shift is altered, the number of worked days is reduced, and a simple two-week schedule cycle alternating work periods with rest periods is employed. Other articles present a task analysis of community nursing activities; the reactions of 565 registered nurses to 16 job factors; and the attitudes of a sample of professional nurses concerning their float assignments. In the job factor study, nurses indicated that factors of safety and security were of greatest importance to them, followed by social esteem and self-actualization factors; pay and personnel policies were of least importance. Supporting tabular data accompany these and other articles.

HRP-0012320/8GA PC$7.75/MF$3.00
Wolf and Co., Washington, D.C.
Evaluation of the Effectiveness of CHPS Agency Assessments, Performance Standards, and Technical Assistance Activities in Strengthening CHP Agency Performance.
Final Rept.
13 Oct 75, 208p
Contract PHS-HRA-106-74-75
See also Executive Summary, HRP-0012321.

Descriptors: United States, Standards, Reviewing, Health resources, Health related organizations, Health care, Evaluation, Criteria, *Comprehensive health planning agencies, *CHP(Comprehensive Health Planning) agencies, Assessments.

The final report of a project prepared under contract for the Bureau of Health Planning and Resources Development (BHPRD) is presented. The goals of the project were to evaluate the relative effect of the Agency Assessment Program on improving the performance status of 314 (a) and (b) agencies, and to determine how well the program's objectives were met and to what extent the technical assistance needs of the agencies have been met by the efforts of the Division of Comprehensive Health Planning. This document describes in detail the methodology used to meet these objectives, the project's findings, and the implications of these findings, particularly as they relate to BHPRD's efforts to implement P.L. 93-641, the National Health Planning and Resources Development Act of 1974. The Performance Status Measurement System was applied to the assessment findings for each agency in order to analyze agency performance status characteristics. Questionnaires and field visits were used to evaluate other aspects of the assessment program. Some of the findings indicate that: performance standards were the major product of the assessment program; the assessment process produced only a rough measure of performance status; the process was seen as facilitating the identification of problems and technical assistance needs; and a formal approach to agency improvement is warranted. Other findings concern management, monitoring systems, corrective action, and pilot technical assistance. A section on the implications of project findings is included.

HRP-0012321/8GA PC$3.50/MF$3.00
Wolf and Co., Washington, D.C.
Evaluation of the Effectiveness of CHPS Agency Assessments, Performance Standards, and Technical Assistance Activities in Strengthening CHP Agency Performance.
Executive Summary
13 Oct 75, 14p
Contract PHS-HRA-106-74-75
See also full report, HRP-0012320.

Descriptors: United States, Standards, Reviewing, Health resources, Health related organizations, Health care, Evaluation, Criteria, *Comprehensive health planning agencies, *CHP(Comprehensive Health Planning) agencies, Assessments.

An executive summary is provided of the final report of a project prepared under contract for the Bureau of Health Planning and Resources Development (BHPRD). The summary consists of an overview of the contract's objectives, brief descriptions of the methodologies used in meeting these objectives, and a summary of major project findings and recommendations. The goals of the project were to evaluate the relative effect of the Agency Assessment Program on improving performance, status of 314 (a) and (b) agencies, and to determine how well the program's objectives were met and to what extent the technical assistance needs of the agencies have been met by the efforts of the Division of Comprehensive Health Planning. The determination of the program's effect on performance status was predicated on the development of a performance status measurement system. Questionnaires and field visits were used to evaluate other aspects of the assessment program. It is noted that the project's findings have major implications for BHPRD's efforts to implement the National Health Planning and Resources Development Act of 1974. Some of these findings indicate that: performance standards were the major product of the assessment program; the assessment process produced only a rough measure of performance status; the process was seen as facilitating the identification of problems and technical assistance needs; and a formal approach to agency improvement is warranted. Other findings concern management, monitoring systems, corrective action, and pilot technical assistance. A section on the implications of project findings is included.

NTIS/PS-76/0697/3GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Immunologic Diseases. Volume 2. 1975-August 1976 (A Bibliography with Abstracts).
Rept. for 1975-Aug 76,
Pernell W. Crockett. Sep 76, 74p*
Supersedes NTIS/PS-75/578, and NTIS/PS-74/126.

Descriptors: *Bibliographies, *Immunologic diseases, Allergic diseases, Pathology, Immunology.
Identifiers: Hypersensitivity, Autoimmune diseases, Allergenic extracts, Allergens.

The bibliography contains research on immunodeficiency, autoimmune, and allergic diseases. The pathologic mechanisms of autoimmunity and hypersensitivity are discussed. Also included are reports on allergenic extracts for diagnostic purposes. (This updated bibliography contains 72 abstracts, 10 of which are new entries to the previous edition.) See also NTIS/PS-75/579, Immunologic Disease. Volume 1, 1964-1974.

PB-255 789/8GA PC$4.00/MF$3.00
NY-Penn Health Planning Council, Inc., Binghamton.
Dental Health Component NY-Penn Area Health Data Series,
James R. Tallon, Jr., Daniel F. Creasey, and James J. O'Brien. Apr 73, 41p NCHSR-76/194
Contract PHS-HSM-110-71-255
See also PB-255 790. Prepared in cooperation with NY-Penn Health Management Corp., Binghamton.

Descriptors: *Dental care, *Health care utilization, *Health surveys, Dental personnel, Health manpower, Tables(Data), New York, Pennsylvania, Interviews, Expenses, Health care requirements, Census, Surveys, Methodology.
Identifiers: *Susquehanna(Pennsylvania), *Broome County(New York), *Chenango(New York), *Tioga(New York), *Tioga(Pennsylvania), *Bradford(Pennsylvania).

The purpose of the report is to present the results on dental care utilization collected in the NY-Penn Community Health Survey. The conduct of the Community Health Survey is described. Data are given on dental care utilization for the residents of the five county NY-Penn area covering: frequency of dental visits, accessibility of dental care, dental trade area, and dental expenditures. Additional information is also presented on the distribution of dental manpower in the area and selected national trends in dental care utilization. A series of tables containing survey results are attached to the report.

PB-255 790/8GA PC$4.00/MF$3.00
NY-Penn Health Planning Council, Inc., Binghamton.
Mental Health Component NY-Penn Area Health Data Series,
James R. Tallon, Jr., Daniel F. Creasey, and James J. O'Brien. Apr 73, 50p NCHSR-76/195
Contract PHS-HSM-110-71-255
See also PB-255 789. Prepared in cooperation with NY-Penn Health Management Corp., Binghamton.

Descriptors: *Mental health care, *Health care requirements, *Health surveys, Alcoholism, Family relations, Mental hygiene, Emotions, Drugs, Narcotics, Tables(Data), New York, Pennsylvania.
Identifiers: *Tioga(New York), Mentally retarded persons, Susquehanna(Pennsylvania), *Broome County(New York), *Chenango(New York), *Tioga(Pennsylvania), *Bradford(Pennsylvania).

The purpose of the report is to describe the mental health problems and needs indicated in a survey of the NY-Penn area. This study is part of the NY-Penn Health Data Series and is based on data from the NY-Penn Community Health Survey. Following a discussion of the Community Health Survey, the report examines five mental health or mental health related areas: alcohol problems, marital problems, mental or emotional problems, mental retardation, and the use of drugs and narcotics. How the community residents perceive the problems and the ways they respond to them are discussed. Finally, information is presented concerning community residents' perceptions of mental health problems and of the additional mental health resources they feel are needed.

PB-256 025/8GA PC$6.75/MF$3.00
National Research Council, Washington, D.C.
Maternal and Child Health Research.
Final rept. 1970-75.
1976, 165p*
Contract N01-HD-5-2818

Descriptors: *Infant health care, *Child health care, Pediatrics, Children, Research, Humans, Embryos, Pregnancy, Grants, Reproduction(Biology), Funding, Health manpower, Health manpower education, Psychology, Sociology, Recommendations, Tables(Data).
Identifiers: *Maternal and child health care programs, Appendices.

The report identifies a number of 'correctable deficiencies' in the U.S. research and training efforts and calls upon NICHD to assume 'lead agency' responsibility for initiating and supporting the needed programs and changes to benefit the health of mothers and children, either directly or indirectly, by increasing fundamental knowledge necessary for that goal.

PB-256 029/0GA PC$4.00/MF$3.00
Bureau of Radiological Health, Rockville, Md.
A Pilot Study of Nuclear Medicine Reporting Through the Medically Oriented Data System.
Technical rept.,
Arthur B. McIntyre, Donald R. Hamilton, and Raymond C. Grant. Jun 76, 32p FDA/BRH-76/91, DHEW/PUBL/FDA-76-8045

Descriptors: *Information systems, Statistical data, Hospitals, Patients, Tables(Data), Characteristics, Surveys, Occurrence, Tests, Diagnostic agents, Radioactive isotopes, Medical centers, In vivo analysis, Radiation dosage.
Identifiers: *Nuclear medicine, *Medical information systems, Radiopharmaceutical agents.

The report documents nuclear medicine information collected from six hospitals during a pilot study of the Medically Oriented Data Systems (MODS). There is marked variability in the data reported from individual hospitals with respect to the procedures performed and patient characteristics. The results of this study may not be representative of all hospitals, but they do provide a detailed illustration of nuclear medicine as practiced in the participating hospitals.

PB-256 037/3GA PC$4.00/MF$3.00
American Council on Education, Washington, D.C. Higher Education Panel.
Nonfederal Funding of Biomedical Research and Development: A Survey of Doctoral Institutions.
Final rept. FY 1970 and FY 1974,
Frank J. Atelsek, and Irene L. Gomberg. Jul 75, 40p* HEP-25
Grant NSF-GR-99
Sponsored in part by Office of Education, Washington, D.C. and National Institutes of Health, Bethesda, Md.

Descriptors: *Research and development, Funding, Tables(Data), Questionnaires, Surveys, Methodology, State governments, Local governments, Response.
Identifiers: Appendices, *Medical research, Biomedicine.

The survey sought to gauge the present availability of alternative nonfederal funding sources for biomedical research and development at doctoral institutions, and to elicit from institutional representatives their judgments about the prospects for increased participation by state and local governments, foundations, voluntary health agencies, and industry. The survey was based on the Higher Education Panel which includes a sample of 220 of the 288 Ph.D.-granting institutions. Data are presented for fiscal years 1970 and 1974, by control of institution, by level of NIH research and development support, for institutions with medical schools and those without medical schools. Nonfederal sources applied 23 percent of the total funding for biomedical research in FY 1974.

PB-256 192-SET/GA PC$25.50/MF$7.25
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program.
1 Mar 76, 667p-in 5v
Set includes PB-256 193 thru PB-256 197.

No abstract available.

PB-256 193/4GA PC$4.50/MF$3.00
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program. Volume I. Report of Findings.
Final rept.
1 Mar 76, 63p G-39-Vol-1, SRS-74-16/1
Contract SRS-74-29
Also available in set of 5 reports as PB-256 192-SET, PC$25.50/MF$7.25.

Descriptors: *Medicaid, *Health insurance, Elderly persons, Blindness, Utilization, Surveys, Expenses, Income, Design, Methodology, Tables(Data), Washington(State), North Dakota, Michigan, New Mexico, Oklahoma, Mississippi, Alabama, Kentucky, Tennessee, South Carolina.
Identifiers: Disabled persons, *Supplemental security income.

The results of a survey are presented in five volumes. The survey was conducted during 1973-1974 to examine trends in eligibility, utilization, and expenditures among Medicaid recipients in 10 states. The survey coincided with introduction of the supplemental security income (SSI) program for the aged, blind, and disabled on January 1, 1974. With SSI implementation, each state had to exercise one of three options relative to categorically needy Medicaid coverage. The following states were selected for the survey: Washington, North Dakota, Michigan, New Mexico, Oklahoma, Mississippi, Alabama, Kentucky, Tennessee, and South Carolina. Data were obtained on public assistance and Medicaid programs before and after the introduction of SSI. The impact of the SSI program on the long-term care sector of Medicaid programs in the 10 states was not large.

PB-256 194/2GA PC$6.00/MF$3.00
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program. Volume II. State Medicaid Programs.
Final rept.
1 Mar 76, 129p G-39-Vol-2, SRS-74-16/2
Contract SRS-74-29
Also available in set of 5 reports as PB-256 192-SET, PC$25.50/MF$7.25.

Descriptors: *Medicaid, *Health insurance, Mississippi, Alabama, Kentucky, Tennessee, Utilization, Income, Surveys, Tables(Data), Evaluation, South Carolina, Health care services, Standards, Criteria, Requirements, Washington(State), North Dakota, Michigan, New Mexico, Oklahoma.
Identifiers: *Supplemental security income.

Medicaid programs in 10 states are summarized in relation to the supplemental security income (SSI) program introduced in January 1974. Medicaid programs in 1973 and 1974 were surveyed in 10 states. The following program aspects were emphasized in the survey: eligibility criteria, services provided, 1974 changes in covered services, resource standards, categorical definitions, requirements for coverage, and administrative options selected for use by each state. In evaluating administrative options, consideration was given to the criterion used to define the basic categorically needy population, locus of Medicaid eligibility determinations, payment and administration decisions for state supplementary payments, and the coverage of optional categorically needy groups. Detailed summaries of state Medicaid programs are provided, along with supporting tabular data. Portions of this document are not fully legible.

PB-256 195/9GA PC$4.00/MF$3.00
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program. Volume III. The Supplemental Security Income Program.
Final rept.
1 Mar 76, 41p G-39-Vol-3, SRS-74-16/3
Contract SRS-74-29
Also available in set of 5 reports as PB-256 192-SET, PC$25.50/MF$7.25.

Descriptors: *Medicaid, *Health insurance, South Carolina, Tennessee, Utilization, Income, Elderly persons, Blindness, Standards, Criteria, Rehabilitation, Washington(State), North Dakota, Michigan, New Mexico, Oklahoma, Mississippi, Alabama, Kentucky.
Identifiers: Disabled persons, *Supplemental security income.

An overview of the supplemental security income (SSI) program for the aged, blind, and disabled is presented. The Social Security Amendments of 1972 established the SSI program under Title XVI of the Social Security Act. The SSI program was implemented in January 1974. Eligibility criteria are examined in relation to essential persons, earned and unearned income, income exclusions, calculation of income, income eligibility standards and benefits, resource limitations and exclusions, spenddown provisions, and referral for rehabilitation. Benefits under the SSI program are also assessed.

PB-256 196/7GA PC$4.00/MF$3.00
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program. Volume IV. Federal Medicaid Regulations.
Final rept.
1 Mar 76, 29p G-39-Vol-4, SRS-74-16/4
Contract SRS-74-29
Also available in set of 5 reports as PB-256 192-SET, PC$25.50/MF$7.25.

Descriptors: *Medicaid, *Health insurance, National government, Regulations, Income, Utilization, Mississippi, Alabama, Kentucky, Tennessee, South Carolina, Washington(State), North Dakota, Michigan, New Mexico, Oklahoma.
Identifiers: *Supplemental security income.

Federal Medicaid regulations are discussed in terms of covered groups and types of assistance. When the supplemental security income (SSI) program was implemented in January 1974, three options were available to state agencies for defining the categorically needy population: (1) extend Medicaid coverage to all recipients of basic SSI benefits; (2) extend Medicaid coverage to all recipients of basic SSI benefits and/or state supplementary payments; or (3) extend Medicaid coverage to a group meeting eligibility standards no less restrictive than those of the SSI program. Required and optional groups to be covered under each state's Medicaid program are delineated, along with financial restrictions imposed for eligibility on each group. Services which must be provided for the categorically needy are described, and those which may be covered for the categorically and medically needy are noted.

PB-256 197/5GA PC$11.00/MF$3.00
Applied Management Sciences, Inc., Silver Spring, Md.
A Ten-State Study of Medicaid Eligibility and Utilization Changes Coinciding with the Introduction of the Supplemental Security Income Program. Appendix A. State Medicaid Tabulations.
Final rept.
1 Mar 76, 405p G-39-App-A, SRS-74-16/App

Contract SRS-74-29
Also available in set of 5 reports as PB-256 192-SET, PC$25.50/MF$7.25.

Descriptors: *Medicaid, *Health insurance, South Carolina, Kentucky, Michigan, Washington(State), Long term care, Tables(Data), Income, Utilization, Surveys, Home nursing, Health care facilities, Hospitals, Oklahoma, Mississippi, New Mexico, North Dakota, Tennessee, Alabama.
Identifiers: Appendices, Supplemental security income.

Data on Medicaid programs in 10 states are tabulated in an appendix to a survey report concerned with Medicaid eligibility and utilization changes coinciding with introduction of the supplemental security income (SSI) program in January 1974. Data were obtained from computerized files on Medicaid eligibility and Medicaid claims in 10 states for 1973 and 1974. It was necessary to examine a portion of 1975's paid claims as well to identify those paid for services received in 1974. Tabulations on data for long-term care services are provided which cover long-term hospitals, home health services, skilled nursing facilities, and intermediate care facilities. Utilization, expenditure, and recipient data are included for comparison with data on the eligible Medicaid population. Medicaid program data from the following states are presented: Oklahoma, Mississippi, New Mexico, North Dakota, Tennessee, Alabama, South Carolina, Kentucky, Michigan, and Washington. Portions of this document are not fully legible.

PB-256 242/9GA PC$8.00/MF$3.00
Orkand Corp., Silver Spring, Md.
Final Overview of HRA Programs and Policies as They Affect Minority and Low-Income Groups.
Oct 75, 241p TR-75W-029, HRA/OA-75/101
Contract PHS-HRA-230-75-0081

Descriptors: *Minority groups, *Low income groups, Reviews, Bibliographies, Policies, Evaluation, Health resources, Grants, Models, Financing, Grants, Methodology, Organizational theory, Analyzing, Legislation, Assessments, Budgeting, Projects.
Identifiers: *Health Resources Administration, *HRA(Health Resources Administration), Government agencies.

Evaluative criteria and strategies are presented for three Health Resources Administration (HRA) programs, together with a preliminary conceptual evaluation design each of the three programs. These programs are: health resources development; capitation grants to health professions schools; and construction grants to health profession schools. The health resources development program is designed to provide financial assistance. The capitation program is a mechanism through which the Federal government provides financial support to designated health professions schools. The construction grant program authorizes matching grants of up to 80 percent of the total costs of construction, replacement or renovation of educational facilities in the health sciences.

PB-256 289/0GA PC$5.50/MF$3.00
Baylor Coll. of Medicine, Houston, Tex. Center for Allied Health Manpower Development.
Evaluation of the Current and Prospective Utilization of Mid-Level Health Care Professionals.
Final rept.
Jan 76, 105p HEW/Reg-6-74-1

Descriptors: *Health care utilization, *Health manpower, Arkansas, Louisiana, Reviews, Evaluation, Surveys, Questionnaires, Allied health personnel, Medical personnel, New Mexico, Physicians, Employment, Distribution, Objectives, Statistical data, Demography, Nurses, Physician assistants, Oklahoma, Texas, Methodology.

A survey of physicians in DHEW Region VI undertaken to evaluate their utilization of formally and informally educated mid-level health professionals, is documented. A questionnaire was sent to all physicians in the Region, asking them to report the types of mid-level health care professionals employed in their practice settings, to evaluate the levels of responsibility delegated to these professionals for managing various patient problems, and to furnish demographic information about their practice settings and mid-level employees. Of the physicians surveyed, 28.29 percent (7,183) returned usable responses. Of the respondents, 2,713 employed a total of 6,383 informally educated mid-level professionals in their practice. One finding was that more physician's assistants than nurse practitioners practice in smaller communities. Generally, physicians employing the informally and formally educated mid-level professionals reported favorable impressions of these individuals. Those physicians not employing mid-level workers indicated that they required further information on the subject.

PB-256 297/3GA PC$6.75/MF$3.00
Orkand Corp., Silver Spring, Md.
Evaluation Design for Inventory and Assessment of Health Agency Planning and Evaluation Studies. Report B.
23 Aug 74, 161p TR-74W-010, BHSR-74-24-B
Contract PHS-HRA-116-74-133

Descriptors: *Health planning agencies, Planning, Evaluation, Design, Inventories, Assessments, Characteristics, Classifications, Reviews, Tables(Data), Costs, CHP(Comprehensive Health Planning) agencies, Comprehensive health planning agencies, Methodology.

A project is described to develop an inventory and assessment of health agency planning and evaluation studies and methodologies for use by health planning agencies such as the Health Resources Administration (HRA). A literature search and an internal documentation review has been underway since the effective date of the project. The former includes a MEDLARS search as well as extensive investigation into published sources focusing on planning and evaluation methodologies. Activities undertaken during the evaluation design task effort included the development of definitions and criteria for several concepts; the identification of both methodologies and sites for further investigation; the specification of components, subcomponents, measures, and data elements that describe the setting in which health planning and evaluation studies are conducted; the development of data collection procedures and data analysis techniques including interview guidelines and data summary formats; and the delineation of the community funds flow evaluation design.

PB-256 327/8GA PC$5.50/MF$3.00
Vermont Univ., Burlington. Dept. of Pediatrics.
VT/NH Regional Perinatal Program: Development and Evaluation of an Educational Program for Recognition and Early Treatment of Neonatal Respiratory Insufficiency and Failure.
Annual rept. Jul 75-Jun 76,
Jerold F. Lucey. 29 Jun 76, 101p NIH-N01-HR-5-2961
Contract N01-HR-5-2961

Descriptors: *Health education, *Infant health care, *Respiratory diseases, Resuscitation, Control, Morbidity, Mortality, Regional planning, Physicians, Nurses, Pediatrics, New Hampshire, Vermont, Rural areas.

The educational program is designed to decrease the frequency and severity of respiratory disorders, and hence decrease perinatal morbidity and mortality in New Hampshire and Vermont. All hospitals received (1) nursing workshops held in five different locations; (2) a nurse-physician conference; (3) hospital site visits; and (4) selected reprints. 'Intervention' hospitals received (1) transport conferences, where cases referred to the centers are discussed at the referral hospital by a team from the center, and (2) nursing mini visits, where nurses may discuss topics of specific concern to them. A resuscitation course to be given to members of the perinatal team at 'intervention' hospitals has been prepared. Evaluation techniques showed that: (1) demographic data revealed some differences in age structure, 'intervention' hospitals having a higher Dependency Ratio; (2) mortality rates showed no differences between 'intervention' and 'control' hospitals for the years 1970-1975; (3) pre and post tests given in conjunction with the nursing workshops showed no differences between 'intervention' and 'control'.

PB-256 407/8GA PC$5.50/MF$3.00
Educational Testing Service, Princeton, N.J.
Financial Assistance to Health Professions Students: Patterns of Institutional Administration of Loans and Scholarships. (Measuring Student Financial Need in the Health Professions Student Loan and Scholarship Programs).
Final rept.,
James L. Bowman. Jun 75, 117p BHM-72/7
Contract N01-PE-2-4082

Descriptors: *Health manpower education, *Medical economics, Health occupations, Financing, Loans, Students, Medical personnel, Allied health personnel, Tables(Data), Evaluation, Methodology, Criteria, Measurement, Budgeting.
Identifiers: Appendices.

The Health Professions Student Loan and Scholarship (HPSLS) Programs assist students who need financial assistance to pursue a course of study leading to a degree of doctor of medicine, doctor of dental surgery or equivalent degree, doctor of osteopathy, doctor of optometry or equivalent degree, doctor of veterinary medicine or equivalent degree, or to a bachelor of science in pharmacy or equivalent degree. The goal of the program is to increase the health manpower resources of the nation by providing financial assistance in the form of long-term low interest loans to students in need who have been accepted for enrollment, or are already enrolled in specified health professions schools, to enable them to pursue their course of study; and by providing scholarships to students of exceptional financial need who need such assistance to pursue the specified studies. This study secured information on financial aid practices and methodologies at participating health professions institutions in the following areas: (1) financial aid administration, (2) staffing of financial aid officers, (3) selection of HPSLS recipients, (4) need analysis criteria, and (5) procedures used to package aid.

PB-256 646/1GA PC$4.50/MF$3.00
Central Utah Community Mental Health Center, Provo, Utah.
Central Utah Community Mental Health Center Impact Study.
Final rept.,
Burton C. Kelly. May 71, 62p NIMH-70-9(a)

Descriptors: *Mental health care, *Ambulatory health care, *Health resources, Community health services, Utah, Effectiveness, Health care utilization, Evaluation.
Identifiers: *Community mental health centers.

The effectiveness of the Central Utah Community Mental Health Center in reducing the number of Central Utah residents receiving inpatient care at the State Hospital is evaluated. The catchment area served by the Center comprises three counties in the north central sector of the state. A comparison catchment area, Weber County, was selected against which data from the Central Utah area could be compared. The Center was established in February 1967 to provide a variety of mental health-related outpatient and day care services, as well as to take over the inpatient unit of the State Hospital in Provo serving Central Utah residents. Unique among the Center's outpatient services is a survival training program in which individuals are taught to survive on their own in remote areas, the aim being to reorient them to the demands of reality.

PB-256 663/6GA PC$5.50/MF$3.00
Kentucky Univ., Lexington. Coll. of Allied Health Professions.
Proceedings of Workshop on Interdisciplinary Education, Kentucky January Prototype, Held at University of Kentucky Carnahan Conference Center, Lexington, Kentucky, on April 15-17, 1975.
Special rept.,
Tom Connelly, Jr., and Joseph Hamburg. 1975, 108p HRA/OC-76/109
Contract PHS-HRA-231-75-0204

Descriptors: *Meetings, *Kentucky, *Health manpower education, *Allied health personnel, Medical personnel, Students, Planning, Interviews, Evaluation, Methodology, Community relations, Faculty, Tables(Data), Universities.
Identifiers: Appendices.

The workshop was held to acquaint selected participants with the conceptual and operational details of interdisciplinary education in allied health as carried out in the State of Kentucky for a three week period in January. This educational experience has been identified as 'Kentucky January.' More than 570 senior students from 17 disciplines have taken part in four sequences conducted since 1972. Over a three day period participants were given pertinent information in written form and verbally by program staff. A question and answer period between participants and program staff, students, faculty and location coordinators, provided personal input and information for future planning. Participants recognized the depths and complexity of the program and were all pleased with the conference results. Subsequent to identifying program obstacles such as funding, scheduling problems and in some instances ideology problems, the workshop participants were still intrigued by the Kentucky January program concept and sincerely interested in considering a similar type program on their respective campuses.

PB-256 678/4GA PC$4.50/MF$3.00
Bureau of Radiological Health, Rockville, Md.
Dental Exposure Normalization Technique 'DENT' Instruction Manual,
C. Larry Crabtree, and Wayne R. Jameson. May 76, 61p* DHEW/PUBL/FDA-76/8042, FDA/BRH-76/92

Descriptors: *Dentistry, *Radiography, *X ray analysis, Health physics, Irradiation, Exposure, Quality assurance, Control, Patients, Medical personnel, Manuals.

The DENT Instruction Manual is designed for use by radiation control agencies in planning, initiating, and operating a successful dental exposure reduction program. The manual can serve as a guide and reference for conducting all phases of the program. It details the assistance offered by the Bureau of Radiological Health, as well as the responsibilities and functions of participating radiation control agencies.

PB-256 681/8GA PC$4.00/MF$3.00
Center for Research in Ambulatory Health Care Administration, Denver, Col..
Aquarius II: The Future of Ambulatory Health Care Administration,
Carol Brierly Golin. Jun 76, 50p HRA/OC-76/110
Contract N01-MB-44176

Descriptors: *Ambulatory health care, Regulations, Health care delivery systems, Forecasting, Interviews, Policies, Health care costs, Group medical practice, Quality assurance, Health care technology, Health care utilization, Management, Consumer affairs.
Identifiers: Health consumers.

Contents:
- A common future-America and group practice;
- A glimpse into the future-Longer life, more leisure, new opportunities;
- Medicine tommorrow-More groups, more outpatient services, more prevention;
- Increasing costs-Effective utilization of health care facilities;
- The inevitability of regulation with a national health program;
- The emerging conflict between technology and cost in medicine;
- The medical group-Test tube for new health care experiments;
- Quality, cost, and equal access-Variables at cross purposes;
- The effect of consumerism in medicine-A plan for keeping patients cost-conscious.

PB-256 773/3GA PC$8.00/MF$3.00
Center for Research in Ambulatory Health Care Administration, Denver, Colo.
Group Practice Administration: Current and Future Roles.
Final rept. 30 Jun 74-30 Jun 76,
Edward K. Morita, Richard P. Hodapp, and Carl H. Slater. 30 Jun 76, 243p HRA/OC-76/111
Contract N01-MB-4-4176
Prepared in cooperation with Colorado Univ. Medical Center, Denver. Div. of Health Administration. See also PB-256 774.

Descriptors: *Health care delivery, *Medical group practice, *Ambulatory health care, Recommendations, Health manpower education, Methodology, Curricula, Objectives, Forecasting, Health care, Tables(Data), Surveys, Questionnaires, Management methods, Fees, Payment.
Identifiers: Curriculum development, Appendices, *Health services administration.

The study describes the current and future roles of lay administrators, medical directors, and governing bodies of fee-for-service and prepay medical group practices of various sizes to be potentially useful to educators in curriculum evaluation and design. The objectives were to: (1) Describe and analyze administration in certain group practice forms of health care delivery; (2) identify basic differences that occur in administration under different payment plans and under different sizes of group practices; (3) describe and analyze administrative interactions among lay administrators, medical directors and governing bodies; (4) identify differences in administive interactions occurring under different payment plans and different sizes of group practices; (5) describe and analyze the future roles of administrators in the management of group practice; (6) identify shifts or changes in administrative roles and interactions among administrators when groups change from fee-for-service to prepay payment; (7) describe and analyze demographic data and work histories of group practice administrators.

PB-256 774/1GA PC$12.00/MF$3.00
Center for Research in Ambulatory Health Care Administration, Denver, Colo.
Group Practice Administration: Current and Future Roles. Supplement. Annotated Data Tables.
Final rept.,
James E. Shoemaker. 1976, 470p HRA/OC-76/112
Contract N01-MB-4-4176
Prepared in cooperation with Colorado Univ. Medical Center, Denver. See also PB-256 773.

Descriptors: *Medical group practice, *Health care delivery, *Ambulatory health care, Medical services, Tables(Data), Management methods, Health manpower education.
Identifiers: *Health services administration.

The supplement includes all raw data which were delivered under Contract No. N01-MB-44176. The raw data are presented in tabular format, and each table is introduced with a description of the data and how the data are organized in the table. Also, each table and its description are presented together in a singular unit so that the unit may be removed intact from the body of this supplement.

PB-256 805/3GA PC$5.00/MF$3.00
Orkand Corp., Silver Spring, Md.
An Evaluation of the Effects of Hospital Cost Finding Procedures on the Determination of Ambulatory Service Costs.
May 75, 96p TR-75W-014, HRA-74/7
Contract PHS-HRA-230-75-0081

Descriptors: *Health care costs, *Ambulatory health care, Medical services, Objectives, Health economics, Evaluation, Hospitals, Reviews, Health care delivery systems, Interviews, Surveys, Health care facilities, Methodology, Economic analysis, Bibliographies, Health resources, Health care services, Tables(Data).
Identifiers: Appendices, Third party payers.

Hospital cost finding procedures are evaluated in this study in terms of their effect on the determination of ambulatory service costs. Commissioned by the Health Resources Administration of DHEW, this study focused on eight hospitals on the basis of bed size range (under or over 200 beds) and control/ownership classification (non-profit, municipal, proprietary, teaching). A literature search also was conducted and third party payers were interviewed. Significant limitations were revealed in the use of current hospital cost finding procedures to determine ambulatory service costs. The allocation of direct costs to revenue producing cost centers is merely a mechanical process intended to facilitate cost allocations and is insufficient by itself to determine ambulatory costs. Costs attributable to non-revenue producing cost centers are uncontrollable by the revenue producing cost centers to which they are allocated. In addition, techniques used to compute inpatient and outpatient costs under Medicare and Medicaid procedures are ineffective in identifying ambulatory services costs.

PB-256 872/3GA PC$6.75/MF$3.00
General Electric Corporate Research and Development, Schenectady, N.Y.
An Assessment of the Storage and Retrieval of Radiographic Images,
Kirby G. Vosburgh, and John M. Houston. 28 Jul 75, 159p SRD-75-128, NSF/RA/T-75-080
Grant NSF-APR74-20095

Descriptors: *Radiography, *Information retrieval, *Data storage, Radiology, Medical records, X rays, Miniaturization, Radiographic film, Assessments, Feasibility, Health care technology, Bibliographies, Information systems.
Identifiers: *Medical information systems.

The storage and retrieval of radiographs in American hospitals provide a prototypical ex-

ample of the application of technology to problems in medical care. Existing storage and retrieval systems are often described as inadequate, and they are unsophisticated; a logical question is whether 'space-age' technology will alleviate problems with these systems. The aims of this study are: (1) to present a quantitative analysis of the existing systems for the storage and retrieval of radiographs; (2) to explore alternative technologies to the present system; and (3) to provide a detailed analysis of the feasibility and acceptability of radiographic systems which provide a direct miniaturized image. An extensive bibliography of recent publications is provided.

PB-256 937/4GA PC$4.50/MF$3.00
National Environmental Research Center, Cincinnati, Ohio. Water Supply Research Lab.
Review of the Causes of Waterborne Disease Outbreaks.
Gunther F. Craun, and Leland J. McCabe. Jun 71, 60p
Presented at the American Water Works Association Annual Meeting, Held at Denver, Colorado, June, 1971.

Descriptors: *Infectious diseases, *Water supply, *Potable water, Public health, Sanitary engineering, Water pollution, Contamination, Microorganisms, Tables(Data).
Identifiers: Waterborne, Water pollution effects(Humans).

Waterborne outbreaks occur because of inadequacies in water systems and deficiencies in their operation. Unless needed improvements are made in both public and private water systems, it is expected that a residual number of outbreaks will continue to occur in this country. The disinfection of ground water systems would be a relatively easy and simple means to reduce waterborne disease.

PB-256 964/8GA PC$3.50/MF$3.00
Harvard School of Dental Medicine, Boston, Mass.
Estimation of Caries-Producing Potential of Human Foods and Their Potential Role as Carriers of Possible Caries-Inhibiting Agents by Assays with Experimental Rodents.
Final rept. 29 Jun 71-28 Dec 74,
James H. Shaw. Apr 76, 14p NIH-N01-DE-12382-11, , NIH-NIDR-71-2382
Contract N01-DE-1-2382

Descriptors: *Dental caries, Etiology, Diet, Food, Food habits, Food consumption, Carbohydrates, Sucrose, Phosphorus organic compounds, Humans, Rats, Laboratory animals, Experimental data, Assaying.
Identifiers: *Cariostatic agents.

A series of experiments with caries-susceptible rats was conducted to design assays for estimation of the caries-producing potential of food items. These assays were utilized to estimate the caries-producing potential of some common food items. Under our laboratory circumstances, the caries-producing potential of those foods did not always agree with their concentrations of mono- and disaccharides. Supplements of 2% sodium phytate and 2% sodium glycerophosphate did not demonstrate caries-inhibiting properties under these experimental conditions. A supplement of 2% sodium trimetaphosphate was highly caries-inhibiting under various circumstances, including presence in the mouth at times when the caries-producing agent, sucrose, was not simultaneously present. Levels of 5 or 10% sorbitol or mannitol in a diet of low caries-producing potential showed no evidence of being able to support the initiation and progression of carious lesions; in contrast, 5 or 10% sucrose in the same diet supported the carious process.

PB-256 970/5GA PC$3.50/MF$3.00
Virginia Univ., Charlottesville. School of Medicine.
In vitro Test for Sarcoidosis.
Annual rept. Apr 75-Jun 76,
Gerald L. Mandell. Jul 76, 10p NIH-N01-HR-4-2958
Contract N01-HR-2958
See also PB-240 989.

Descriptors: *Sarcoidosis, *Immunology, Respiratory diseases, Skin diseases, Granuloma, Tissue culture, Leukocytes, Lymphocytes, Blood cells, In vitro analysis, Tests, Diagnosis, Antigens, Phagocytes.
Identifiers: Kveim's test(Sarcoidosis), Migration inhibition factor, Lymphocyte transformation.

The goal is to develop an in vitro test that can be performed on several ml of venous blood. This test should correlate well with the in vivo Kveim test which is presently the best, most generally accepted test for sarcoidosis. This test should serve to identify patients with sarcoidosis without the necessity of injecting foreign material and subjecting the patients to biopsy. The in vitro test should be more rapid than the Kveim test; results should be obtained in one week. Most of the in vitro work in diagnosing sarcoidosis has centered around lymphocyte transformation in association with Kveim antigen and production of macrophage migration inhibition factor by lymphocytes from patients with sarcoid. Investigators have found that lymphocytes from patients with sarcoidosis transform more actively than lymphocytes from controls and that these lymphocytes produce more migration inhibitory factor than lymphocytes from controls. The report discusses test procedures and results.

PB-256 974/7GA PC$4.50/MF$3.00
Pacific Medical Center, San Francisco, Calif.
An Educational Program for Early Recognition and Treatment of Acute Respiratory Insufficiency. P.A.R.I.S. (Prevention of Acute Respiratory Insufficiency Syndrome).
Annual rept. 1 Jun 75-25 Jun 76,
Harvey Tucker, Rodger Shepherd, and Bruce Spivey. 20 Jun 76, 60p NIH-N01-HR-42964-A76
Contract N01-HR-42964

Descriptors: *Health education, *Respiratory diseases, Health manpower education, Acute care, Preventive medicine, Diagnosis, Therapy, Morbidity, Mortality, Evaluation.

The PARIS Project (Prevention of Acute Respiratory Insufficiency Syndrome) is an educational research project concerned with the prevention, early recognition and therapy of acute respiratory insufficiency in acute care hospitals and their communities. The project is designed to assist professional and non-professional personnel to acquire essential skills and knowledge to recognize ARI and to initiate prompt and acceptable therapeutic procedures to help reduce both morbidity and mortality. This training program is designed to meet the needs of all members of the respiratory care team, including the physician, nurse, physical therapist, respiratory therapist, and laboratory technician. Primary evaluation is through medical record audit.

PB-256 978/8GA PC$5.00/MF$3.00
Boston City Hospital, Mass. Channing Lab.
Case Control Studies on Host Factors as Determinants of Chronic Obstructive Pulmonary Disease (COPD) Susceptibility.
Final rept. 1975-76,
Ira Tager. 1 Jul 76, 93p NIH-N01-HR-2-2944-A76
Contract N01-HR-2-2944-A76
See also report dated Oct 73, PB-229 484.

Descriptors: *Respiratory diseases, *Bronchitis, Diagnosis, Epidemiology, Genetics, Immunology, Etiology, Bacteria, Environments, Surveys, Questionnaires, Tables(Data).
Identifiers: Chronic obstructive lung disease, Boston(Massachusetts).

A case-control study designed to determine if there is familial aggregation of chronic bronchitis (CB) and obstructive airway diseases (OAD) has been completed. Familial aggregation has been demonstrated for CB and perhaps OAD, but the effect of this aggregation on predicting the occurrence of disease has been shown to be small. Sibling aggregation of level of FEV1 has also been observed but once again the predictive value (for level of FEV1) is small. No specific biologic or environmental components to the observed aggregation have been identified.

PB-257 031/5GA PC$18.75/MF$3.00
National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, Bethesda, Md.
Transcript of the Meeting Proceedings (19th) National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, Held at Bethesda, Maryland on June 11-13, 1976.
13 Jun 76, 724p NCPHS/M-76/12

Descriptors: *Meetings, *Psychotherapy, Ethics, Surgery, Psychology, Legislation, Research, Experimentation, Death, Humans, Recommendations.
Identifiers: *Prisoners rights, Prisoners, *Medical research, *Medical ethics.

The edition is a transcript of the June 11-13 meeting of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. On June 11 the Commission held a public hearing on psychosurgery and heard preliminary reports from contractors on the following topics related to psychosurgery: a literature search; the results of a retrospective study of efficacy of the procedure. The June 12 and 13 meetings were devoted to discussion and deliberations of the Commission's report on research involving prisoners.

PB-257 051/3GA PC$4.00/MF$3.00
National Maritime Research Center-Kings Point, N.Y.
The Marine Physician's Assistant: Effect on the Frequency and Distribution of Illness and Injury Reports from U.S. Merchant Ships.
Technical rept.,
Lawrence Zeitlin, Robert Hart, and Martin J. Schwimmer. Mar 76, 34p NMRC-KP-159
Contract MA-2-4262

Descriptors: *Physicians assistants, *Merchant ships, Effectiveness, Health manpower, Distribution, Allied health personnel, Injuries, Diseases, Recommendations, Tables(Data).
Identifiers: Frequency.

The illness/injury reports filed with the Marine Index Bureau (MIB) for a three-year period (1971, 1972, and 1973) from a matched sample of 20 U.S. flag ships, 10 with Marine Physician's Assistants (MPA) aboard, 10 without, were compared with regard to the nature and severity of reported incidents. The presence of the MPA served to significantly reduce the number of minor illness/injury reports filed with the MIB without markedly changing the number of reports of major incidents. Little evidence was developed about the MPA's medical efficacy or the long-run impact of his presence aboard U.S. flag ships.

PB-257 057/0GA PC$6.75/MF$3.00
Family Health Program, Inc., Long Beach, Calif.
A Department of Human Relations: Its Role in the HMO.
Final rept. 30 Jun 74-14 Jan 76,
Josephine S. Gumbiner. 14 Jan 76, 156p
HRA/OC-76/105

Contract N01-MB-44197

Descriptors: *Health maintenance organizations, *HMO(Health Maintenance Organizations), Nutrition, Family planning, Assessments, Medical group practice, Prepaid health care, Health insurance, Research, Methodology, Evaluation, Recommendations, Interpersonal relations, Cost effectiveness, California, Mental health care, Health education, Preventive medicine.
Identifiers: Appendices.

The purpose of the report is to assess the results of an 18-month project, funded jointly by HEW and the Family Health Program of Southern California. The project was started on June 30, 1974 and its goals were to design, implement, and evaluate a Department of Human Relations in an HMO setting. This department would include the following services: mental health, medical social work, health education, and certain aspects of preventive medicine, such as nutritional counselling, family planning, well-baby care, and health screening. The HMO Act of 1973, passed in December of that year, had clearly indicated that these services would be mandatory in any HMO approved by the Federal government. Because they are broadly inter-related, it seemed logical to combine them into one department, and to test out whether such a department can provide these services in a way that is both cost effective and conducive to quality care.

PB-257 224/6GA PC$16.25/MF$3.00
Health Services Mobility Study, New York.
Task Descriptions in Diagnostic Radiology. Volume 1. Medical Tasks: What the Radiologist Does.
Research rept. no. 7,
Eleanor Gilpatrick. Jul 76, 694p* DLETA-82-34-69-34-RR7-1
Contract DL-82-34-69-34
Sponsored in part by Hunter Coll., New York, and City Univ. of New York. Research Foundation.

Descriptors: *Medical personnel, Diagnosis, Radiology, Job analysis, Medical education, Professional personnel, Specialized training, Health occupations, Qualifications, Medical education, Health manpower education.
Identifiers: *Radiologists, Radiologic technologists.

Research Report No. 7 is the first full-scale demonstration of the task description method of the Health Services Mobility Study. The four volumes present task descriptions covering all the work in a hospital Department of Diagnostic Radiology. Vol. 1 covers most of the medical activities carried out by diagnostic radiologists. The document describes how the material was collected, the coverage, the definition of task, and how to read the task descriptions. It includes a guide to the tasks arranged by system of the body, function, and main type of patient involved. These task descriptions are offered for use as instructional materials to train residents, interns, medical students and for team training of technologists, health physicists and nurses. They can be used as inputs to the design of career ladders, for structuring jobs, assigning tasks to titles, as inputs to the development of performance evaluation or proficiency test instruments, and for human resource development and counseling.

PB-257 313/7GA PC$9.00/MF$3.00
National Center for Health Services Research, Rockville, Md.
Summary of Grants and Contracts Active on June 30, 1974.
1974, 268p

Descriptors: *Research and development, *Grants, *Contracts, *Health care services, Financing, Projects, Indexes(Documentation), Distribution, Utilization, Quality, Organizational theory, Availability, Abstracts.

The seventh edition contains all projects active on June 30, 1974. It is intended to serve as a reference document for staff of the National Center and other interested individuals, regarding studies and programs being supported by NCHSRD on problems relating to the availability, organization, distribution, utilization, quality and financing health services. Projects are organized alphabetically by grant or contract number. Several indexes are included for cross reference purposes: (1) Alphabetical index by principal investigators; (2) Alphabetical index by institutions; (3) Alphabetical listing by State; Dates indicated for each project represent the project period. For each grant and contract, the parenthetical dollar figure represents the total funds (direct and indirect costs) awarded during FY 1974.

6F. Environmental Biology

AD-A029 326/6GA PC$7.50/MF$3.00
Hawaii Univ Honolulu Dept of Entomology
Susceptibility of Termites to Microbes.
Final rept. 17 Mar 69-31 Dec 74,
Minoru Tamashiro. Aug 76, 178p
Contract N00014-67-A-0387-0006

Descriptors: *Termites, *Nematoda, *Insect control, Biological control, Fungi, Mortality rates.
Identifiers: Coptotermes formosanus, Neoaplectana carpocapsae, Metarrhizium anisopliae, Beauveria bassiana, *Biological insect control.

This report concerns the biology, ecology and susceptibility of the Formosan subterranean termite Coptotermes formosanus to the insect pathogenic nematode Neoaplectana carpocapsae. The nematode Neoaplectana carpocapsae entered the termite through the mouth or through the anus. And penetration was more frequent than oral. Once in the gut it penetrated the gut wall and entered the hemoceal where it released the bacteria. The termite was killed by a massive septicemia. The nematodes multiplied and emerged from the cadaver. In the laboratory, the pathogen was transferred to a new host but in the field colonies the infection was not transmitted to another host. The same situation obtained with the fungal pathogens, Metarrhizium anisopliae and Beauveria bassiana.

NTIS/PS-76/0696/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
DDT, DDD, and DDE Pesticides (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
Edward J. Lehmann. Sep 76, 212p*
Supersedes NTIS/PS-75/640, and NTIS/PS-74/135.

Descriptors: *Bibliographies, *Insecticides, *DDT, *Water pollution, *Ecology, Agriculture, Decomposition, Chlorine organic compounds, Marine biology, Biodeterioration, Metabolism, Residues, Aquatic biology, Fresh water biology, Toxicology, Limnology, Fishes, Estuaries, Soil chemistry.
Identifiers: *DDD pesticide, *DDE pesticide, Liquid waste disposal, Water pollution effects(Plants), Water pollution effects(Animals), Ecosystems.

Research on DDT, DDD, and DDE Pesticides are covered. This includes their ecological effects, pollution, uses, biodegradation, and accumulation in animals and plants. (This updated bibliography contains 210 abatracts, 36 of which are new entries to the previous edition.)

PB-256 844/2GA PC$4.00/MF$3.00
Howard Univ., Washington, D.C. Dept. of Botany.
Ozone and Vascular Tissue Differentiation in Plants.
Final rept. Oct 72-May 74,
John P. Rier, Jr. May 76, 35p EPA/600/3-76/068
Grant R-801209

Descriptors: *Ozone, *Plant growth, *Plant tissues, Plant physiology, Plants(Botany), Oxygen, Plant anatomy, Acetic acid, Plant chemistry, Recommendations, Experimental data, Enzymes, Proteins, Methodology, Exposure, Research.
Identifiers: *Air pollution effects(Plants).

The study is concerned with the influence of ozone on the process of vascular tissue differentiation in plants and the concomitant changes in plant proteins. The test materials consisted of wounded plant intermodes and callus tissues grown, exposed, and studied under controlled laboratory conditions. Ozone was more effective in reducing xylem regeneration in those internodes grown with indole-3-acetic acid than with 2,4-dichlorophenoxyacetic acid. From the results, it was concluded that plant internodes and callus tissues can be used to study the effects of ozone on certain processes related to plant growth and development.

PB-257 107/3GA PC$5.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Criteria and Evaluation Div.
Pesticidal Aspects of Chlordane in Relation to Man and the Environment,
O. Garth Fitzhugh, and Homer E. Fairchild. Aug 76, 114p* EPA/540/4-76/006

Descriptors: *Pesticides, *Chlordan, Insecticides, Toxicology, Ecology, Epidemiology, Fishes, Wildlife, Aquatic biology, Environments, Residues, Food chains, Vegetable crops, Chlorine organic compounds, Halohydrocarbons, Tables(Data), Reviews, United States.
Identifiers: Pesticide residues, Ecosystems.

The review evaluates scientific data in the areas of fish, wildlife, distribution in the environment, residues in crops and food items, and toxicology and epidemiology. This review summarizes rather than interprets scientific data studied during the process of reviewing chlordane. It is not intended that this report correlate data from different sources. The review also does not present opinions on contradictory findings. The review of chlordane covers all uses of the pesticide in the United States and should be applicable to future needs in the Agency.

6H. Food

AD-A029 543/6GA PC$4.00/MF$3.00
Army Natick Research and Development Command Mass
A Cost and Systems Effectiveness Analysis of the XM-75 and XM-76 Field Feeding Systems for Marine Corps Divisions.
Technical rept.,
Michael B. Kulinski, Robert S. Smith, and I. E. Stefaniw. Jul 76, 38p Rept no. NARADCOM-TR-7T-10-OR/SA

Descriptors: *Food service, *Field conditions, Battalion level organizations, Marine Corps personnel, Test and evaluation, Manpower utilization, Experimental design, Cost effectiveness, Systems analysis, Combat areas.
Identifiers: XM-75 mobile kitchens, XM-76 mobile kitchens.

A cost and systems effectiveness analysis was performed for Marine Corps Divisions comparing two new consolidated feeding systems (designated XM-75 and XM-76). The results demonstrated that both of the new systems

were superior to the conventional Marine Corps system. Of the two new systems, the XM-75 is preferred providing a relative worth of 39% more than the conventional system and 5% more than the XM-76.

PB-256 700/6GA PC$8.00/MF$3.00
National Research Council, Washington, D.C. Committee on Climate and Weather Fluctuations and Agricultural Production.
Climate and Food: Climatic Fluctuation and U.S. Agricultural Production.
30 Jun 76, 234p* NSF/RA-760168

Descriptors: *Climate, *Agriculture, *Food supply, Seasonal variations, Production, Weather modification, Farm crops, Pest control, Forestry, Plant genetics, Fisheries, Policies, Farm management, Land use, Water resources, Plant diseases.

The report deals with the impact of fluctuating weather and climate on food production. The material discussed represents the efforts of over forty scientists from both meteorology and agriculture. The complexity of the issues addressed underscores the urgency of further comprehensive examination. The influence of weather and climate on agricultural production takes on increasing importance as global population increases and our grain reserves decrease. This report is written for those who control the policies and direction of agriculturally oriented institutions and research programs. Topics include relationships among climatic variables, land and water resources, biological factors, and related technology. Management options are examined and research is recommended. Portions of this document are not fully legible.

PB-256 746/9GA PC$3.50
Louisiana State Univ., Baton Rouge. Dept. of Food Science.
Lipid Fatty Acid Composition of Shrimp Meals and Crustacean Diets,
Jeanne D. Joseph, and S. P. Meyers. Sep 75, 3p
LSU-R-75-008, NOAA-76042104
Prepared in cooperation with South Carolina Wildlife and Marine Resources Dept., Charleston. Marine Resources Center Grant NOAA-04-5-158-5, Contrib-42. Pub. in Feedstuffs, v47 n35, 1 Sep 75.

Descriptors: *Lipids, *Fatty acids, *Crustacea, *Shrimps, *Feeding stuffs, Lipid metabolism, Diets, Food analysis, Aquatic animals, Aquaculture, Food chemistry, Animal nutrition.
Identifiers: Reprints, Sea Grant program.

Significant differences in lipids and fatty acid composition exist between meals derived from different shrimp wastes. So use of shrimp meals in aquacultural rations will require careful attention to such aspects. Thorough analyses of diet are being conducted to establish a clearer understanding of the lipid metabolism of shrimp and prawns. In this article the two diets used on the two crustacean species are commented on briefly.

6J. Industrial (Occupational) Medicine

AD-A029 669/9GA PC$3.50/MF$3.00
Army Inst of Dental Research Washington D C
Potential Hazards in Military Dental Practice.
Literature review,
Eugene F. Huget, and Duane E. Cutright. 1976, 11p

Descriptors: *Occupational diseases, *Dentists, Epidemiology, Toxic hazards, Aerosols, Dust, Military medicine, Minerals, Inhalation, Respiratory diseases, Particulates.

Many daily professional activities of the dentist are based upon the preparation, direct use and mechanical alternation (grinding) of dust producing minerals and Aerosolizable substances include, but are not limited to cements, plaster and dental stone, refractory investments and the filler constituents of irreversible hydrocolloid (alginate) impression materials. The potential for inhalation of airborne toxic materials by the military dentist who practices in a group situation would appear to be greater than that of his civilian counterpart. Presently, the degree of danger to which military dental personnel are exposed during the performance of routine duties is uncertain.

HRP-0005971/7GA PC$4.00
North Carolina State Dept. of Labor, Raleigh. Office of Occupational Safety and Health.
Occupational Health Program Guide for North Carolina Employers.
1973, 26p

Descriptors: Safety hazards, *Occupational safety and health, *North Carolina, Industrial medicine, *Environmental health.

A guide is presented for use by North Carolina employers in establishing effective occupational health programs in compliance with safety and health standards set forth in the U.S. Occupational Safety and Health Act (OSHA) of 1970. The guide defines the basic objective and the scope of an occupational health program, and considers briefly the roles of management and of health professionals in the programs. Several basic concepts of an effective program are outlined, including the pre-placement health evaluation, job placement, periodic health evaluations, recognition of occupational health hazards, evaluation of these hazards, and control of occupational health hazards through engineering, education of employees, and enforcement of health procedures and safety rules. The selection and use of personal protective equipment, such as respirators, ear protection devices, and protective clothing, are discussed. The most frequently cited OSHA violations are noted, with reference to the applicable section of the Code. The violations listed are in the areas of occupational noise exposure, spray finishing operations (ventilation), air contaminants, open surface tanks (ventilation), medical and first aid, and exposure to airborne asbestos fibers. A summary is presented of OSHA standards. Included in the summary are Chemical Abstracts Service registry numbers for several carcinogenic substances common in the occupational environment. A list of occupational health services available in North Carolina, a description of the occupational illnesses most prevalent in that State, a summary of target health hazards for North Carolina, and a list of sources of occupational health information are included. Portions of this document are not fully legible.

PB-257 654/7GA PC$3.50/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1975,
Thomas D. Murphy, Nadia J. Dayem, J. Stewart Bland, and Walter J. Pasciak. Jun 76, 25p
NUREG-0109

Descriptors: *Industrial medicine, *Power reactors, *Radiation hazards, Personnel, Exposure, Health physics, Radiation dosage, Tables(Data), Absorption(Biology).
Identifiers: *Occupational safety and health, *Light water reactors, Appendices, Bioaccumulation.

The report presents an updated compilation of occupational radiation exposures at commercial light water cooled power reactors for the years 1969 through 1975. The information is derived from reports submitted to the United States Nuclear Regulatory Commission in accordance with requirements of individual plant Technical Specifications and Part 20.407 of Title 10, Chapter 1, Code of Federal Regulations (10 CFR Part 20.407). The MAN-REM/UNIT for all LWR's in 1975 is greater than the 1974 value. The cumulative average since 1969 continues to increase. No significant trend was indicated over the period of 1969-1975 in the mean value of MAN-REM/MEGAWATT-YEAR.

6L. Medical and Hospital Equipment

HRP-0005947/7GA Not available NTIS
Britons Develop Non-Invasive Diagnostic System.
1972, 2p
Pub. in Jnl. of the American Medical Association v223 n1 p7-8 Jan 73.

Descriptors: *Medical equipment, Innovations, Health care technology, Health care services, Foreign countries, *Diagnostic agents, Diagnosis.

Routine diagnostic use of a recently - developed, computerized, axial tomography scanning unit in a suburban London, England hospital is discussed in this article. The scanning unit is being evaluated at the hospital while engineers complete refinements on a computer that will be 'mated' with it. The equipment employs a narrow beam of roentgen rays to scan the patient's head (encased in a rubber cap in the scanner unit) in 'slices' 0.8 cm to 1.3 cm thick. These rays pass through the skull to two sensing devices which remain in constant alignment on the opposite side. The scanning unit is rotated around the head, stopping for 180 scans at one - degree intervals, with each detector taking a total of 28,000 readings per scan. The readings are stored on a magnetic disk, from which the computer calculates absorption values. The computer then produces a picture made up of 6,400 matrix points, discriminating between tissues of minutely varying (as little as 0.5 percent) density. Radiologists can distinguish tumors, cysts, or hemorrhages on these pictures. The computer's picture can be produced on a cathode ray tube viewing unit for direct examination or it can be recorded photographically.

HRP-0007062/3GA Not available NTIS
Public Health Service, Bethesda, Md. Div. of Hospital and Medical Facilities.
Fire Prevention in Hospitals.
Julian Smariga. 1965, 5p
This article was originally entitled 'These Steps Help Prevent Hospital Fires and Fatalities'.
Pub. in The Modern Hospital v105 n1 Jul 65.

Descriptors: Safety hazards, Revisions, Occupational safety and health, Health care technology, Health care facilities, Environmental health, Design.

Five steps in planning for fire safety in hospitals are described: minimizing the chance of fire, early discovery, restricting fire spread, extinguishing the fire, and evacuating the building. With regard to minimizing the chance of fire, it is noted that the most effective contribution a building designer can make is in the selection of proper materials and equipment, all of which should be incombustible. The importance of early fire detection is emphasized, and it is noted that all but the very smallest hospital buildings should be provided with an internal fire alarm system, interconnected if possible to transmit an alarm to the municipal fire department. The design of individual rooms as sealable units with no openings to other rooms or parts of the building except for necessary ventilation is cited as a necessity for restricting the

spread of fire. It is noted that many building fires, if discovered at an early stage, may be held in check or put out by persons reasonably well trained in handling fire extinguishers. With regard to planning for evacuation, it is noted that the use of compartmentation (division of a floor area by using transverse fire-restrictive partitions and corridor doors) may obviate the need for an extensive evacuation procedure. Data are provided on causes of hospital fires, origin of fires, fatal and nonfatal injuries caused by hospital fires, and types of fire extinguishers.

HRP-0007411/2GA Not available NTIS
Rhode Island Univ., Kingston. Dept. of Industrial Engineering.
Maintenance System for a Small Hospital.
Charles F. James, Joseph Stanislao, and Sharad Wavde. 1970, 3p
Pub. in Hospitals, Jnl. of the American Hospital Association v44 n24 p70-71, 74 16 Dec 70.

Descriptors: State regions, Specifications, Rhode Island, Personnel management, Performance standards, Methodology, Medical equipment, Health resources, Health planning agencies, Health care technology, Health care facilities, Data processing, Data processing systems, Data collection, Data acquisition.

A system is described that includes both preventive and corrective maintenance for a small hospital, based on experience at the 142-bed Westerly Hospital in Rhode Island. Equally applicable to any small health care organization such as a nursing home, the system is based on a program of weekly inspection and maintenance. The following system elements are included: work order form and procedures for its utilization, full set of equipment data records, and weekly schedule for comprehensive preventive maintenance. Maintenance service needs are communicated by hospital staff to the maintenance department via the work order. Equipment data records contain the item and its description, name of manufacturer, initial installation cost, date when put in service, and equipment specifications. It is noted that the weekly schedule should remain flexible to enable the maintenance supervisor to use the skills of his employees to best advantage. A weekly maintenance schedule form which is coded to denote three categories of maintenance (overhaul, clean, and functional check) can be of assistance to the supervisor in determining the number of man-hours needed for the week, in general and for specific pieces of equipment. The system can be further refined for the purpose of charge - back accounting by keypunching certain data from work orders, and this information can be computerized to provide total man-hours, total maintenance costs, and accumulated totals of man-hours for individual classification.

HRP-0009807/9GA PC$8.00/MF$3.00
Westerman-Miller, Associates, New York.
The Health Maintenance Organization Facility Development Handbook.
Final rept.,
Louis F. Reuter, IV. 1975, 232p HSA-75-13-025, DHEW/OFEPM-76/05
Contract PHS-HSM-110-73-491
Prepared in cooperation with Bureau of Community Health Services, Rockville, Md.

Descriptors: *Health maintenance organizations, *Handbooks, *Health care facilities, Systems analysis, Systems engineering, Health planning, Organizing, Design, Site surveys, Equipment, Supplies, Management planning, Feasibility.

The handbook is a guide to the issues and problems of planning, programming, providing, and operation facilities for a health maintenance organization (HMO). The publication addresses the entire group of people who would be involved in conceiving, implementing, and operating the HMO. The handbook primarily concentrates on the process from that point in planning where the HMO has determined that a need exists for a facility to that point where the conceptual design has been completed. However, the reader is also advised of the process required prior and subsequent to this period. The work is based on a series of case studies including onsite reviews of three operating health maintenance organizations. Existing and pending legislation and regulations were considered. Functional programming, space programming, several procurement options, and economic feasibility were also researched and discussed.

HRP-0009905/1GA PC$6.00
Comprehensive Health Planning Council for Northern New Jersey, Totawa.
Planning for Computerized Axial Tomography: A Report of Methodology Development and Application in the Northern New Jersey Region.
Sep 75, 132p

Descriptors: State government, Specifications, Plans, Performance standards, Patients, New Jersey, *Medical equipment, Local government, Inpatients, Health resources, *Health care technology, Health care facilities, Health care delivery, *Diagnostic agents, Diagnosis, Acute care.

The use of computerized axial tomographic (CAT) equipment for brain disorder diagnosis is evaluated, based on its application in northern New Jersey. In 1973-74, the New Jersey medical community generated a rapid demand for CAT units from manufacturers despite high costs and the anticipation of more technically and productively significant generations of equipment. Health planners for the State and areawide jurisdictions were required to develop criteria for the allocation of CAT units which considered consumer needs, costs, and possible technical obsolescence of first-generation CAT units. An areawide planning council in New Jersey developed and applied allocation criteria which included State interim guidelines, technical state of the art information, direct medical provider input and participation, areawide planning data, and directly related medical utilization data. The council designed a survey questionnaire to obtain information on which groups in the planning area desired to use CAT equipment, the magnitude and cost of procedures likely to be delivered with CAT equipment, staff and institutional capability to operate CAT equipment, and willingness to report on the utilization of CAT equipment after it became operational. An areawide seminar was held to obtain the opinions of areawide providers and interested consumers on planning issues involved in the use of CAT equipment. The allocation criteria that were developed for CAT equipment allow for maximum areawide patient utilization and take into consideration local demography, use availability for institutions not planning acquisition of CAT units, and opportunity for the addition of later generations of CAT units as they may be required. Portions of this document are not fully legible.

PAT-APPL-698 688/GA PC$3.50/MF$3.00
Department of Health, Education, and Welfare, Washington, D.C.
Powered Wheel Chair.
Patent Application,
Woodrow Seamone. Filed 22 Jun 76, 9p PB-256 528/1, DHEW-VA-1-74
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Wheel chairs, *Medical equipment, Motors, Power, Torque, Man machine systems, Human factors engineering, Operators(Personnel).

Disclosed in the patent application is a powered wheel chair with individual motors driving each of two separate drive wheels. The motors are controlled by the amount of torque applied to the handrim of the driving wheel. If the operator pushes on the handrim of the drive wheel, as is well known, the torque created by such movement is sensed and activates the drive motor to cause the drive wheel to rotate. The power applied to the drive motor is controlled by the amount of torque applied to the handrim such that the conventional control of the wheel chair is maintained.

PATENT-3 965 402 Not available NTIS
Department of the Navy Washington D C
Headrest Proportional Control for Motorized Wheelchair.
Patent,
Douglas H. Mogle. Filed 1 Jul 74, patented 22 Jun 76, 7p AD-D002 909/0, PAT-APPL-484 383
Supersedes AD-D000 481.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Medical equipment, *Patents, Head(Anatomy), Motors, Operation, Control, Headgear.
Identifiers: PAT-CL-318-55, *Wheel chairs.

The invention is a head controlled mechanism for the proportional control of a driven device. A mechanism is provided whereby a control signal is generated proportional to the movement of the head of an operator to control the speed and direction of the driven device.

PATENT-3 966 160 Not available NTIS
Department of the Air Force Washington D C
Inflight Intravenous Bottle Holder.
Patent,
Myrl E. Wilson. Filed 12 May 75, patented 29 Jun 76, 7p AD-D002 856/3, PAT-APPL-576 504
Supersedes AD-D000 817.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Medical equipment, Bottles, Holders, Parenteral infusions, Inflight, Aeromedical evacuation, Aircraft.
Identifiers: PAT-CL-248-311.3.

The patent discloses a bottle holder assembly in a preferred embodiment adapted for use as an inflight intravenous bottle holder aboard an aircraft on an aeromedical airlift mission. The holder comprises: a cradle, generally configurated in the form of an inverted T, with an upper and a lower end and with a slot in each end, and with each end bent backwardly; a hook removably connected to the upper end; and, a strap subassembly attached to the cradle and suitably configurated and dimensioned to accept a standard intravenous bottle which is in the inverted, operative position. The intravenous bottle holder is removably attachable to, and slideably movable along, any one of the plurality of conventional litter support straps which such an aircraft is equipped.

PB-255 892/2GA PC$4.50/MF$3.00
Bureau of Radiological Health, Rockville, Md.
Quality Control for Scintillation Cameras.
Final rept.
Jun 76, 55p* FDA/BHR-76/90, DHEW/PUBL/FDA-76/8046

Descriptors: *Medical equipment, *Radiology, Performance evaluation, Quality control, Models, Tissues(Biology), Recommendations, Images, Cameras, Scintillation, Dosimetry, Health physics.
Identifiers: *Scintillation cameras, *Phantoms, *Nuclear medicine, Appendices, Diagnostic equipment.

In order to insure the detectability of faults that may occur in the imaging performance of a scintillation camera system, a monitoring program establishing 'quality control' should be implemented in every facility using these devices. The production of high quality images on a long-term basis can only be accomplished by monitoring the operational status of a scintillation camera at frequent intervals. This report summarizes the components of a 'quality control' program and outlines most useful 'quality control' techniques for scintillation cameras. Recommendations based on a minimum daily monitoring program will be presented. In addition the report contains a flow chart of operational and quality control procedures for scintillation cameras, a glossary of performance parameters and terms, and a compilation of multipurpose phantoms available for use in nuclear medicine.

PB-255 973/0GA PC$5.50/MF$3.00
Toronto Univ. (Ontario). Radiological Research Labs.
Photographic Quality Assurance in Diagnostic Radiology, Nuclear Medicine, and Radiation Therapy. Volume I. The Basic Principles of Daily Photographic Quality Assurance.
Final rept.,
Joel E. Gray, and James J. Vucich. Jun 76, 103p* FDA/BRH-76/89, , DHEW/PUBL/FDA-76/8043
Contract PHS-PLD-10839-74

Descriptors: *Medical equipment, *Manuals, *Radiology, *Radiotherapy, *Radiography, Health physics, Photography, Quality assurance, Radiological technologists, Objectives, Photographic materials, Sensitometers, Measuring instruments, Densitometers, Diagnostic agents, Specialized training, Evaluation, Calibrating.
Identifiers: *Nuclear medicine, Diagnostic equipment.

The objective of the two-part manual is to provide the information necessary to establish and maintain an effective photographic quality assurance program in diagnostic radiology, nuclear medicine, and radiation therapy. Volume I (Volume II to be printed in the near future) provides the x-ray technologist with basic, practical information necessary for the establishment and maintenance of a photographic quality assurance program involving a minimum investment in his time for training and daily quality assurance procedures and a minimum investment in equipment and materials.

PB-256 725/3GA PC$4.00/MF$3.00
Carnegie-Mellon Inst. of Research, Pittsburgh, Pa.
Investigation of Interpenetrating Polymer Networks for Biological Applications.
Annual rept. 22 Mar 75-31 Mar 76,
G. C. Berry, M. S. Morgan, M. Dror, and C. J. Grundmann. May 76, 48p NIH-N01-HB-3-2949-7
Contract N01-HB-3-2949

Descriptors: *Polymers, Copolymers, Polymerization, Heparins, Polyurethane resins, Polyacrylates, Polyacrylamides, Siloxanes, Silane, Silicon inorganic compounds, Silicon organic compounds, Blood platelets, Compatibility, Materials.
Identifiers: *Biomaterials, *Blood compatible materials, Hydrogels, Vena cava ring prosthetics, Renal embolus ring.

Described are preparations of interpenetrating polymers of polyacrylamide, poly(2-hydroxyethyl methacrylate) and poly(2-hydroxyethyl acrylate) in a poly(urethane-ether) block copolymer. The modified polymers absorb 50-135% water while retaining excellent strength properties. Water absorption is accomplished by an increase in the sheet thickness with little or no change in its lateral area. The second phase of the report describes work which involves the heparinization of silicone rubber. Several variables in the procedure for applying the coupling agent (gamma-aminopropyltriethoxy-silane) and subsequent acidification of the amino group were studied. A chemical assay has been developed to monitor the heparin concentration on the surface. Vena cava test rings, renal embolus test rings and 20 mil sheet were fabricated, and heparinized for testing.

PB-256 875/6GA PC$10.75/MF$3.00
Thoratec Labs. Corp., Emeryville, Calif.
The Fabrication of Implantable Artificial Heart Devices and Components.
Annual rept. Feb 75-Mar 76,
T. C. Robinson, J. Donald Hill, S. Kitrilakis, and K. E. Buck. Apr 76, 378p NIH-N01-HV-2035-5
Contract N01-HV-2035
See also Annual rept. no. 4, PB-243 394.

Descriptors: *Mechanical hearts, Mechanical organs, Fabrication, In vivo analysis, In vitro analysis, Design, Bioengineering, Bovines, Humans, Implantation, Performance evaluation.
Identifiers: *Cardiac assist devices, *Left ventricular assist device, Appendices.

The report describes the development, fabrication, and evaluation of an implantable Left Ventricular Assist Device (LVAD) designed specifically for human use. The current Model VI LVAD allows actuation by pneumatic and electrical drive systems under development by DTB contractors. Eighteen LVADs were evaluated. All functional goals were met in hydrodynamic tests, hemodynamic studies in calves, and in vitro life tests. Pump bladders functioned 10 months without failure. Chronic studies in calves began recently; seven were performed for up to 30 days without limitations due to thrombogenesis, endurance, or other problems. Percutaneous leads were fabricated and 14 evaluated in calves for up to 176 days and continued free from infections. Forty-six axisymmetric bladders were fabricated. Blood-materials studies continued with the microporous tissue interface and polyurethane coatings.

PB-257 073/7GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
The Acoustic Pressure Field Alongside a Manikin's Head with a View Towards 'In situ' Hearing Aid Tests,
Edwin D. Burnett, and George F. Kuhn. Aug 76, 26p NBSIR-76-1110
Presented at the meeting of the Acoustical Society of America (91st), Statler-Hilton Hotel, Washington, D.C., 7 Apr 76.

Descriptors: *Hearing aids, Performance tests, Medical equipment, Sound pressure, Anatomical models, Frequency response, Audiometry, Simulation, Tables(Data), Experimental data, Head(Anatomy).
Identifiers: In situ analysis, Bioinstrumentation.

To simulate actual usage conditions, the frequency response of hearing aids was measured on the head of a manikin over the frequency range of 0.2 to 8 kHz. The acoustic pressure around the head can vary rapidly as a function of frequency and location. In order to compare and interpret the hearing aid response at various frequencies and locations on the head, it is necessary to precisely know the pressure variations. The amplitude and phase of the acoustic pressure were measured in increments ranging from 2 mm to 5 mm alongside a manikin's head with frontal sound incidence. The acoustic driver was located in front of the manikin at a distance of 1.0 m from the ear canal axis. The test frequencies were the octave band center frequencies from 0.5 kHz to 4.0 kHz and the third octave band center frequencies from 4.0 kHz to 8.0 kHz. It will also be shown that pink noise of 6% and 29% bandwidth at 6.3 kHz and 8.0 kHz has a smoothing effect on the acoustic pressure variation with location.

PB-257 219/6GA PC$5.00/MF$3.00
Michigan Univ., Ann Arbor. Dept. of Chemical Engineering.
Evaluation of the Compatibility of Materials in Contact with Blood.
Annual rept. Jun 75-Jun 76,
J. S. Schultz, A. A. Cizrkowski, J. D. Goddard, S. M. Lindenauer, and J. S. Penner. Jul 76, 85p
NIH-N01-HB-4-2962-2
Contract N01-HB-4-2962
See also PB-245 873.

Descriptors: *Blood coagulation, Compatibility, Test chambers, In vivo analysis, Hematology, Evaluation, Surface chemistry, Dogs, Laboratory animals, Tables(Data), Materials, Bypasses, Hydrodynamics, Surgical implantation, Platelets, Blood circulation, Fibrinogen, Polyester fibers, Shear stress.
Identifiers: Protocols, *Blood compatible materials, *Biomaterials, Silastic, Appendices.

An ex-vivo test procedure using dogs was developed for testing the thrombogenicity of biomaterials in contact with blood. A couette-type test chamber capable of producing independent mass-transfer and shear-stress variations on a rotating specimen in the form of a 3/16 inch x 4 inch shaft is used for measuring the formation rate and composition of thrombus formed under well-defined hemodynamic conditions. The design of these experiments consists of a parallel arrangement of test chambers such that two materials are tested simultaneously with one material being a 'reference' material. In addition to comparing materials, this test procedure has the capability of studying the interaction of the hematologic parameters with the biomaterial tested. To further investigate these interactions anticoagulants such as heparin are introduced intra-venously to alter the effects of the hematologic parameters on the biomaterial.

6M. Microbiology:

AD-A029 346/4GA PC$4.00/MF$3.00
Rhode Island Univ Kingston Dept of Plant Pathology-Entomology
Biodegradation of Trinitrotoluene (Alpha TNT) and Its Production Isomers.
Annual rept. Jul 74-Jul 75,
Richard W. Traxler. Jul 75, 29p NARADCOM-TR-76-48-FSL
Contract DAAG17-73-C-0276

Descriptors: *Biodeterioration, *TNT, Waste water, Isomers, Tracer studies, Nitrites, Pseudomonas, Water pollution.
Identifiers: Nitro compounds.

High concentrations of cells of two pseudomonas isolates, IIBX, and S95YUN-5, effectively removed C(14)-labeled TNT from the reaction mixture, the C(14)-label being distributed between cells and filtrate. C(14)-activity was associated with all biochemical components of the cells obtained by solvent fractionation, and was found in chromatograms containing ninhydrin positive materials from the hydrolysis of cellular proteins. Small amounts of nitrite were observed when the reaction was carried out in nitrogen-free medium, suggesting that some of the nitro groups may be released as nitrite. (Author)

AD-A029 445/4GA PC$4.00/MF$3.00
Army Medical Research Inst of Infectious Diseases Frederick Md
Improvement on the Sharp Technique: A Method for Virus Retrieval from Agar with Negative Staining, by Which Changes in Form are Shown for the Coliphage T2L.
Interim rept.,
Anne Buzzell. 4 Aug 76, 28p

Descriptors: *Virology, Bacteriophages, Viruses, Electron microscopy, Stains, Test methods, Identification.
Identifiers: *Sharp technique.

A procedure is described by which virus particles, at low concentration in salt solution, can be enumerated as negative-stained images in the electron microscope. It is based on the Sharp technique of concentrating virus by centrifuging onto agar but the method for retrieving the virus is easier. Since virus is simply washed onto a Formvar film as fluid flows down from the agar, negative staining can be done simultaneously, if stain is incorporated in the agar. With the layer of fluid deposited uniform and very thin, drying is virtually instantaneous, ensuring uniform distribution of the particles and stain. Damage to the particles is also minimized and observation can even be made of structural alterations occurring in solution. Using the technique a change in shape of the coliphage T2L head has been observed which has long been suspected to occur when pH is lowered from 7 to 5. Moreover, the particle shape can be manipulated by varying the conditions of the negative staining.

AD-A029 514/7GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
Aride Virus, a New Ungrouped Arbovirus Infecting 'Amblyomma Loculosum' Ticks from Roseate Terns in Seychelles.
Technical scientific rept.,
J. D. Converse, H. Hoogstraal, M. I. Moussa, M. N. Kaiser, and J. Casals. 29 Aug 75, 6p Rept no. NAMRU-3-TR-13-76
Availability: Pub. in Archives of Virology, v50 n3 p237-240 1976.

Descriptors: *Ticks, *Arboviruses, Disease vectors, Hosts(Biology), Birds, Reprints.
Identifiers: *Aride virus, Amblyomma loculosum, Terns, Culicidae.

A previously underscribed arbovirus, proposed name Aride virus, was recovered from Amblyomma loculosum Neumann, collected from dead roseate terns Sterna dougallii arideensis Mathews in the Seychelles. Some important tick-virus-host associations are discussed. (Author)

PAT-APPL-571 502/GA PC$3.50/MF$3.00
Department of Health, Education, and Welfare, Washington, D.C.
Assay Medium and Method for Identification of Non-Fermentative Gram-Negative Bacteria (NFB).
Patent Application,
Lucy A. Otto. Filed 25 Apr 75, 23p PB-257 020/8, DHEW-E-215-74
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Bacteria, Fermentation, Assaying, Culture media, Tests, Identifying.
Identifiers: *Gram negative organisms.

The patent application describes a method for identification of non-fermentative Gram-negative bacteria (NFB) consisting of correlating results from a plurality of oxidative alkalinization (OAL) assays in media samples consisting essentially of a minimal-protein medium, an indicator and a substrate and a plurality of oxidative acidification (OAC) assays in media consisting essentially of a minimal-protein medium, an indicator and a subtrate. A medium for determining oxidative attack (OA) consists essentially of a minimal-protein medium, an indicator and a substrate.

PB-257 346/7GA PC$4.00/MF$3.00
East Carolina Univ., Greenville, N.C. Dept. of Biology.
Chemical Control of 'Lagenidium', A Fungal Pathogen of Marine Crustacea.
Sea Grant pub.,
C. E. Bland, D. G. Ruch, B. R. Salser, and D. V. Lightner. Mar 76, 43p UNC-SG-76-02, NOAA-76060303
Grant NOAA-04-5-158-46
Prepared in cooperation with Arizona Univ., Tucson. Environmental Research Lab.

Descriptors: *Fungicides, *Marine microorganisms, Fungi, Crustacea, Marine biology, Aquatic biology, In vitro analysis, Lethal dosage, Fungus diseases, Control, Aquaculture, Evaluation, Tables(Data).
Identifiers: Sea Grant program, *Lagenidium callinectes, Mariculture.

The effects of twelve potentially fungitoxic compounds on growth and development of two strains of Lagenidium callinectes Couch were studied. The compounds tested were Benlate, Captan, Dichlone, Difolatan, DS 9073, Dyrene, malachite green, Manzate 200 (Dithane M-45), Terrachlor, Treflan, tribasic copper sulfate, and Vitavax. In vitro tests included determination of the minimum lethal concentration (LS100) of each fungicide, the effects of the LC100 on length of motility, flagellar retraction or detachment, encystment and germination, and the length of time necessary for the LC100 of each fungicide to kill zoospores of L. callinectes. Various animal toxicity tests were conducted also with several of the fungitoxic compounds. Only two compounds, malachite green and DS 9073, appear to be of potential use as disease deterrents in mariculture.

6N. Personnel Selection and Maintenance (Medical)

AD-A029 138/5GA PC$3.50/MF$3.00
Naval Aerospace Medical Research Lab Pensacola Fla
Pulmonary Function Testing in Aviation Selectees.
Robert Bason, Neil R. MacIntyre, and David Vick. 17 May 76, 11p Rept no. NAMRL-1227

Descriptors: *Pulmonary function, *Aviation medicine, Aviation personnel, Respiratory system, Physiology, Respiratory diseases.
Identifiers: Cigarette smoking.

Aviation students were divided into four groups and pulmonary function tests results compared among nonsmokers, former smokers, current smokers, and those with pulmonary symptoms. Cigarette smoking did not have any measurable effect on pulmonary functions. Pulmonary functions for the purpose of establishing norms for this age group according to height are summarized.

6O. Pharmacology

AD-A029 296/1GA PC$3.50/MF$3.00
Walter Reed Army Inst of Research Washington D C
The Absorption, Distribution, Excretion and Metabolism in Mice of a Quinolinemethanol Antimalarial, 2-8-Bis(Trifluoromethyl)-4-(1-Hydroxy-3-(N-T-Butylamino)Propyl)Quinoline Phosphate (WR 184,806.H3PO4),
Joseph M. Grindel, Robert S. Rozman, David M. Leahy, Nicholas A. Molek, and Harold H. Gillum. 17 Nov 75, 9p Rept no. Contrib-1397
Availability: Pub. in Drug Metabolism and Disposition, v4 n2 p133-139 1976.

Descriptors: *Antimalarials, *Quinolines, Metabolism, Mice, Excretion, Pharmacology, Radioactive isotopes, Tracer studies, Chemical analysis, Phosphates, Carbinols, Reprints.
Identifiers: WR184806 antimalarial compounds.

Radioactivity derived from WR 184,806.H3PO4-C(14) was excreted primarily in the feces but also in the urine after either po or ip administration. At least 77-85% of the dose was absorbed by 2-8 hr after po administration. The apparent elimination t(1/2) for WR 184,806-C(14) was 12 hr, calculated from the urinary excretion. Lungs, liver, skeletal muscle, kidneys, small intestine (less contents) and residual carcass were major sites of deposition of total radioactivity after po administration. Within these tissues the radioactivity present was predominantly WR 184,806-C(14) rather than its metabolites. Peak blood plasma levels of WR 184,806-C(14) occurred at 2-4 and 7-10 hr with an apparent elimination t(1/2) of 13.5 hr. Peak erythrocyte levels of WR 184,806-C(14) occurred at 2 and 5-6 hr with an apparent elimination t (1/2) of 20 hr. The presence in the urine and feces of unchanged WR 184,806-C(14) was confirmed by thin-layer chromatographic analysis and by inverse isotope dilution techniques. (Author)

AD-A029 304/3GA PC$3.50/MF$3.00
Walter Reed Army Inst of Research Washington D C
Chemoprophylaxis of Meningococcal Meningitis,
Edmund C. Tramont, and Malcolm S. Artenstein. 1976, 7p
Availability: Pub. in Chemotherapy, v1 p37-42 1976.

Descriptors: *Meningitis, *Chemotherapy, Epidemiology, Prophylaxis, Vaccines, Sulfadiazine, Preventive medicine, Physiological effects, Reprints.
Identifiers: Meningococcal meningitis, Rifampin, Minocycline.

When meningococcal disease (meningitis) occurs as an epidemic, vaccination with groups A and C meningococcal vaccines will be effective against those serogroups while the chances are that sulfadiazine would be effective against groups B and Y disease. The use of minocycline and rifampin must be weighed against the incidence of side reactions, efficacy in the treatment of meningitis and the development of resistant strains. Frequent observation of close contacts must be maintained and the use of chemoprophylaxis can be regarded only as an additive measure at this time. In those situations where the chance of blood stream invasion is high, empirical treatment appears warranted. (Author)

AD-A029 308/4GA PC$3.50/MF$3.00
Edgewood Arsenal Aberdeen Proving Ground Md
Miotic Drugs: A Review of Ocular, Visual, and Systemic Complications.
Special publication Mar 73-Dec 75,
Roy H. Rengstorff, and Marion P. Royston. 15 Sep 75, 14p Rept no. EB-SP-76025
Availability: Pub. in Jnl. of Optometry and Physiological Optics, v53 n2 p70-80 Feb 76.

Descriptors: *Eye, *Drugs, Visual acuity, Cholinesterase inhibitors, Physiological effects, Cataracts, Toxicity, Reprints.
Identifiers: Miotics, Cholinergics.

Cholinergic drugs and anticholinesterases have caused ocular complications including cataracts, iris cysts, retinal detachment, iritis, increased intraocular tension, allergic and toxic reactions, and hyperemia. The visual complications include accommodative spasm; myopia and reduced visual acuity; changes in vision sensitivity, dark adaptation, and visual fields; and discomfort. The systemic complications are those common to cholinergic drugs and anticholinesterases. This review is intended as a ready reference to the drugs that cause such effects and source material. (Author)

AD-A029 429/8GA PC$3.50/MF$3.00
North Carolina Univ At Greensboro Dept of Psychology
The Effects of Ethyl Alcohol on Behavior Maintained by Concurrent Schedules of Reinforcement.
Final rept. Apr 74-Dec 75,
Richard L. Shull, Aaron J. Brownstein, Cora Lee Wetherington, and Marilyn Guilkey. Dec 75, 22p
Rept no. TR-2
Contract DAMD17-74-C-4074

Descriptors: *Drugs, *Ethanols, *Pigeons, *Behavior, Response, Rates, Food, Recovery.

This report describes the effects of ethyl alcohol (ethanol) on the behavior of pigeons maintained by concurrent schedules of food reinforcement (concurrent variable-interval variable-interval schedules). Ethanol had dose related facilitory and suppressive effects on the absolute rate of responding. Ethanol had little effect on the distribution of responses between the two schedules (relative responses). (Author)

AD-A029 478/5GA PC$3.50/MF$3.00
Texas Univ At Galveston Medical Branch
Effects of Nicotinic Acid and Plasma Volume Loss of Experimental Dysbarism,
J. G. Hilton, and C. H. Wells. Feb 76, 5p
Contract N00014-75-C-0105
Availability: Pub. in Undersea Biomedical Research, v3 n2 p157-161 Jun 76.

Descriptors: *Nicotinic acid, *Decompression, *Blood volume, Anesthesia, Dogs, Vasoactive agents, Prostaglandin, Hyperbaric conditions, Labeled substances, Tracer studies, Reprints.

Two groups of dogs anesthetized with sodium pentobarbital were subjected to compression of 60 psig for 60 min and decompressed at the rate of 10 psi/min without staging. Plasma volume was measured in each group by I(131) tagged albumin dilution technique prior to compression, 10 min and 60 min after decompression. One group of animals received no other treatment and the other group received 15 mg/kg of body weight of nicotinic acid by intravenous injection immediately prior to compression and an additional 7.5 mg/kg of body weight of nicotinic acid 30 min after decompression. Both the untreated and the nicotinic acid-treated animals lost significant plasma volume at both the 10- and 60-min postdecompression measurements. Nicotinic acid-treated animals lost significantly less plasma. (Author)

AD-A029 487/6GA PC$3.50/MF$3.00
Naval Medical Research Inst Bethesda Md
Pseudomonas Aeruginosa Exotoxin: Purification by Preparative Polyacrylamide Gel Electrophoresis and the Development of a Highly Specific Antitoxin Serum.
Medical research progress rept.,
Lynn T. Callahan, III. 26 Mar 76, 9p
Availability: Pub. in Infection and Immunity, v14 n1 p55-61 Jul 76.

Descriptors: *Pseudomonas aeruginosa, *Bacterial toxins, *Toxins and antitoxins, Purification, Lethal dosage, Electrophoresis, Column chromatography, Reprints.
Identifiers: Polyacrylamide gel electrophoresis.

Pseudomonas aeruginosa exotoxin has been purified to a specific activity of 12,000 to 16,000 mouse median lethal doses per milligram of protein. Total recovery was about 25% and the degree of purification was approximately 3,000-fold. Preparative polyacrylamide gel electrophoresis greatly facilitated purification. As judged by analytical disc gel electrophoresis the purified toxin contained on major band of protein and only a negligible amount of contamination. Antiserum prepared against the purified toxin neutralized the lethal activity of crude toxin preparations and reacted by double immunodiffusion with a single component of concentrated broth cultures of P. aeruginosa isolates obtained from a clinical source. (Author)

AD-A029 491/8GA PC$3.50/MF$3.00
Naval Medical Research Inst Bethesda Md
Interaction between Hyperbaric Air and d-Amphetamine Effects on Performance.
Medical research progress rept.,
John R. Thomas. 7 Nov 75, 4p
Availability: Pub. in Psychopharmacology, v48 p69-73 1976.

Descriptors: *Amphetamines, *Hyperbaric conditions, Physiological effects, Response(Biology), Rats, Males, Behavior, Dosage, Decompression, Psychotropic agents, Reprints.
Identifiers: Nitrogen narcosis.

Rats performing on a progressive-ratio schedule that required five additional responses for each successive food reinforcement were administered d-amphetamine. The number of responses required increased until the next ratio was not completed within 15 min. The number of reinforcements obtained during a session increased with increasing doses of d-amphetamine from 0.25 mg/kg to a maximum behavioral effect at 1.0 to 2.0 mg/kg followed by a decline with higher doses. To assess the effects of hyperbaric air on the established d-amphetamine performance, the same doses were administered to rats breathing compressed air at seven times normal atmospheric pressure (7.1 ATA). In the hyperbaric condition the dose-effect function was displaced toward smaller doses such that the maximum behavioral effect was obtained at lower doses than under normal atmospheric pressure; doses that produced maximum behavioral effects under normal pressure produced a decline in reinforcements obtained. (Author)

AD-A029 512/1GA PC$3.50/MF$3.00
Naval Medical Research Unit No 3 Fpo New York 09527
The Value of Ethambutol in the Treatment of Tuberculous Meningitis.
Technical scientific rept.,
N. I. Girgis, M. W. Yassin, J. E. Sippel, K. Sorensen, and A. Hassan. 1975, 6p Rept no. NAMRU-3-TR-12-76
Availability: Pub. in Jnl. of Tropical Medicine and Hygiene, v79 p14-17 Jan 76.

Descriptors: *Meningitis, *Tuberculosis, Chemotherapy, Treatment, Mortality rates, Consciousness, Physiological effects, Egypt, Reprints.
Identifiers: *Ethambutol.

This is a prospective treatment study of 86 patients with tuberculous meningitis admitted to the Abbassia Fever Hospital, Cairo, Egypt. The causative organism was cultured from the cerebro spinal fluid in 47 patients, was identified by Zeihl Nelson stain in five and in the remaining 34 patients the diagnosis was based on the clinical course and changes in the CSF chemistry and cell count. The data indicate that ethambutol can be used as a companion drug to INH and streptomycin in the treatment of the disease and that the mortality is directly dependent on the state of consciousness upon initiation of therapy. (Author)

PB-251 905/6GA PC$6.00/MF$3.00
National Inst. on Drug Abuse, Rockville, Md. Div. of Research.
Cannabinoid Assays in Humans.
Final rept.,
Robert E. Willette. May 76, 130p
DHEW/PUBL/ADM-76/339, Research monograph Ser-7
See also PB-249 092.

Descriptors: *Drug addiction, *Blood chemical analysis, Body fluids, Assaying, Chemical analysis, Quantitative analysis, Microanalysis, Chromatographic analysis, Mass spectroscopy.
Identifiers: *Marijuana, *Cannabis sativa, *Urinalysis, Drug abuse, Radioimmunoassays, Metabolites.

Contents:
- Quantitation of cannabinoids in biological fluids by radioimmunoassay;
- Separate radioimmune measurements of body fluid delta 9 THC and 11-nor-9-carboxy-delta 9-THC;
- Radioimmunoassay of delta 9-tetrahydrocannabinol;
- Determination of THC and its metabolites by EMIT homogeneous enzyme immunoassay--A summary report;
- Separation and sensitive analysis of tetrahydrocannabinol in biological fluids by HPLC and GLC;
- Determination of delta 9 tetrahydrocannabinol in human blood serum by electron capture gas chromatography;
- Detection and quantification of tetrahydrocannabinol in blood plasma;
- A method for the identification of acid metabolites of tetrahydrocannabinol (THC) by mass fragmentography;
- Quantitation of cannabinoids in biological specimens using probability based matching gas chromatography/mass spectrometry;
- Quantitation of delta 9-tetrahydrocannabinol in body fluids by gas chromatography/chemical ionization-mass spectrometry;
- HPLC-MS determination of delta-9-tetrahydrocannabinol in human body samples;
- Analytical methods for the determination of cannabinoids in biological materials.

6P. Physiology

AD-A029 145/0GA PC$3.50/MF$3.00
Defence Research Establishment Ottawa (Ontario)
Sweating Characteristics of the Foot.
Technical note,
Malcolm M. Dewar, and Rita M. Crow. May 76, 15p Rept no. DREO-TN-76-11
Abstract in French.

Descriptors: *Footwear, *Perspiration, Feet, Exercise(Physiology), Ventilation, Arctic regions, Canada.

This preliminary study has shown that, under the given experimental conditions, there is no significant difference in the amount of sweat produced by the foot with or without air flowing over and away from the foot. Further, the maximum amount of sweat produced by the foot of an inactive subject is approximately 2-1/2 g and for an active subject approximately 20 g over a half hour interval. The variation in sweating within and between subjects is considerable. (Author)

6Q. Protective Equipment

AD-A029 146/8GA PC$4.00/MF$3.00
Defence Research Establishment Ottawa (Ontario)
Thermal Imaging for Clothing Research - A Review of the Literature.
Technical note,
D. J. Hidson. May 76, 44p Rept no. DREO-TN-76-13
Abstract in French.

Descriptors: *Infrared images, *Protective clothing, Arctic regions, Literature surveys, Diagnosis(Medicine), Experimental design, Infrared detectors, Fabrics, Canada.

This paper reviews the literature relating to thermal imaging (particularly real-time thermal imaging), photoconductive, photovoltaic and pyroelectric infrared detectors and the application of thermal imaging to the design of Arctic clothing. The application of thermal imaging to medical diagnosis and non-destructive testing is also discussed. (Author)

PB-256 786/5GA PC$6.75/MF$3.00
Pennsylvania State Univ., State College. Environmental Acoustics Lab.
Evaluation of Speech Processing Systems. Evaluation of Electronic/Active Hearing Protectors for Use in Underground Coal Mines.
Final rept.,
Paul L. Michael, James H. Prout, Gordon R. Bienvenue, Roger L. Kerlin, and Sara Singer. May 76, 151p BuMines-OFR-96-76
Grant G0155032

Descriptors: *Ear protectors, *Protective coverings, *Coal mines, Personnel, Performance tests, Electronics, Acceptability, Acoustics, Tests, Speech recognition, Earphones, Microphones, Communication equipment, Industrial hygiene.
Identifiers: Hearing conservation, Environmental health.

The report presents a discussion of performance parameters for electronic or active hearing protectors that will meet the needs of underground coal miners. This information is incorporated into a proposed set of specifications that can be used to judge the suitability of a particular electronic hearing protector for the coal mine application. Acoustic and electrical tests were performed on a developmental model of an electronic hearing protector built by the Federal Bureau of Mines. A commercially active hearing protector, the British-built ACOS A-9000/2, was also examined. The recommended test of intelligibility for electronic hearing protectors and other communication systems as used in a coal mine setting is the Modified Rhyme Test (MRT) developed in 1965. The suitability and method of administering this test are discussed.

6R. Radiobiology

AD-A029 370/4GA PC$3.50/MF$3.00
Naval Aerospace Medical Research Lab Pensacola Fla
Nuclear Emulsion Measurements of the Astronauts' Radiation Exposure on the Apollo-Soyuz Mission.
Hermann J. Schaefer, and Jeremiah J. Sullivan. 23 Jun 76, 23p Rept no. NAMRL-1228
NASA Order-T-81D

Descriptors: *Radiation dosage, *Radiation measuring instruments, *Astronauts, *Aerospace medicine, Dosimeters, Proton cross sections, Trapping(Charged particles), Proton counters, Neutron counters, Space shuttles.
Identifiers: Nuclear emulsions, Apollo Soyuz mission.

Ilford G.5 and K.2 emulsions in the astronauts' personnel dosimeter packs furnished quantitative data on the various components of the astronauts' radiation exposure on Apollo-Soyuz. Track and grain counts of the proton population in G.5 and proton ender counts in K.2 emulsion indicate a proton dose of 51 millirad and 74 millirem. Tissue disintegration stars including neutrons contribute an additional 4.6 millirad and 38 millirem. HZE particle tracks were evaluated using a reference scale of tracks with known Z and E values available in the literature.

AD-A029 430/6GA PC$4.00/MF$3.00
Naval Medical Research and Development Command Bethesda Md
Bibliography of Reported Biological Phenomena (Effects) and Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation. Supplement Number 8.
Medical research interim rept.,
Zorach R. Glaser, and Patricia F. Brown. Aug 76, 27p
Supplement to report dated May 76, AD-A025 354.

Descriptors: *Radiation effects, *Microwaves, *Radiofrequency, *Bibliographies, Electromagnetic radiation, Radiobiology, Radio waves, Radiation hazards, Humans, Stress(Physiology), Public health, Signs and symptoms, Biomagnetism.
Identifiers: Radiation effects(Biology).

Almost 350 additional references on the biological responses to radio frequency and microwave radiation, published up to August 1976, are included in this continuing bibliography of the world literature. Particular attention has been paid to the effects of non-ionizing radiation on man at these frequencies. The citations are arranged alphabetically by author (where possible), and contain as much information as possible so as to assure effective retrieval of the original documents. Soviet and East European literature is included in detail.

AD-A029 489/2GA PC$4.50/MF$3.00
Technology Inc San Antonio Tex Life Sciences Div
An Experimental Investigation of the Effect of 1.06 micrometers Laser Light on the Transparent Ocular Media.
Annual rept. 1 Apr 75-29 Feb 76,
Norma D. Miller. Apr 76, 61p Rept no. TI-5040-TSA0002
Contract DAMD17-75-C-5040

Descriptors: *Laser damage, *Eye, *Neodymium lasers, Infrared lasers, YAG lasers, Q-switching, Lenses, Rabbits, Rayleigh scattering, Mie scattering, Thresholds(Physiology), Radiation effects, Light scattering, Opacity.
Identifiers: Radiation effects(Biology).

The effect of 1.06 micrometers light on the clear ocular media of rabbit eyes was investigated. A Q-switched Nd:YAG laser operating in the TEM sub oo mode was used to irradiate the eyes with 100 msec trains of 300 to 700 nsec pulses at 1 KHz repetition rate. A clouding of the ocular media was observed within 24 hours for multiple exposures with energy levels near retinal damage threshold. The latency for the appearance of the clouding ranged from less than an hour for total doses of 50X retinal damage thresholds to approximately 24 hours for total dose of 2X retinal thresholds. A theoretical study of Mie scattering for known cell and other particle sizes of the ocular media is described in the report. The major findings from slit lamp examinations of the exposed eyes is also described. The slit lamp examinations revealed changes in the lens following exposures that took up to one week to develop. The changes were manifest as an increased scatter from the central third of the lenses. (Author)

AD-A029 676/4GA PC$3.50/MF$3.00
Army Inst of Dental Research Washington D C
Pulp Effects of Neodymium Laser: A Preliminary Report.
Rept. for Jan 75-Aug 76,
James C. Adrian. 19 Aug 76, 13p

Descriptors: *Radiation effects, *Lasers, *Dental pulp, Neodymium, Rhesus monkeys, Histology, Pathology, Teeth, Dentistry.
Identifiers: Neodymium lasers.

A total of eight teeth from two Rhesus monkeys were exposed to various amounts of Neodymium laser radiation. The pulp response was found to be much less severe than that in a study of 19 teeth previously reported for exposure to similar amounts of ruby laser radiation. If additional studies support this initial finding, it is suggested that a reevaluation of laser mediated procedures in vital teeth be initiated.

PB-256 698/2GA PC$3.50/MF$3.00
Environmental Monitoring and Support Lab., Las Vegas, Nev.
Distribution of Ingested Americium in Chickens and Transport to Eggs.
Final rept. 1975,
Anita A. Mullen, Stephen R. Lloyd, and Robert E. Mosley. May 76, 15p EPA/600/3-76/058

Descriptors: *Americium isotopes, *Chickens, *Food chains, Metabolism, Radioactive isotopes, Eggs, Poultry, Domestic animals, Bioassay, Tissues(Biology), Absorption(Biology), Radiation dosage, Ingestion(Biology), Dose rate, Radioactive contaminants.

The soluble citrate complex of americium-241 was orally administered to 20 white Leghorn laying hens daily for two weeks. The yolks, whites, and shells from the eggs were analyzed for their americium content. Yolk was the only egg fraction in which radioactivity was observed. The americium-241 activity in yolks reached a maximum on the 14th day of dosing. Biological half-times of 2.00 plus or minus 0.18 days and greater than 33 days were indicated by the average concentration values of americium-241 in yolks laid after the maximum activity was reached. The hens were serially sacrificed at 1, 10, and 20 days after the final administration of americium-241. Tissue samples were collected and the americium content determined in the edible portions and feathers of the hens. Americium was detected in most tissues shortly after dosing; the main concentrations were found in the liver and the skeleton. The highest concentration per organ (3.03 X 0.001 percent of the dose) occurred in the liver of the hens sacrificed 10 days after final administration of americium-241.

PB-257 002/6GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Office of Standard Reference Materials.
Radioisotope and Radiopharmaceutical Standards.
Final rept.,
William P. Reed. 1974, 4p
Pub. in Proceedings of San Diego Biomedical Symposium, held at San Diego, Calif., on Feb 6-8, 1974, n13 p507-509 1974.

Descriptors: *Radioactive isotopes, Standards, Measurement, Radioactivity, Laboratories.
Identifiers: *Radiopharmaceutical agents, Nuclear medicine.

The paper briefly discusses the radioactivity measurement system and three of the efforts at NBS to meet the needs for meaningful measurement. These are: (1) the NBS-SRM program that supplies national standards to the system; (2) the AIF or ANSI effort that will provide commercial standards of high quality related to the national standards; and (3) the NBS-CAP pro-

gram that provides experience in making meaningful measurment at the user level and that serves to document the state-of-the-art in these measurements.

PB-257 077/8GA PC$3.50/MF$3.00
Office of Radiation Programs, Washington, D.C. Environmental Analysis Div.
Radiation Characteristics of Traffic Radar Systems.
Technical note,
Norbert N. Hankin. Mar 76, 16p ORP/EAD-76/1

Descriptors: *Radiation hazards, *Microwaves, *Radar equipment, Vehicular traffic control, Power measurement, Environmental engineering, Law enforcement.
Identifiers: Electromagnetic radiation hazards, Power density, *Police equipment.

The results of measurements and calculations of microwave radiation power density produced by two typical traffic radar systems were reported and discussed in this report. Traffic radar systems are small portable units used by police to determine speed of vehicles relative to that of the police vehicle in which the unit is mounted. It was determined that traffic radars were low-powered devices, incapable of producing environmental levels of microwave radiation greater than 0.01 W/sq m at distances where persons would normally be exposed during use of such systems. Police personnel using the radar system could be exposed to power densities up to 36 W/sq m. For comparison purposes, the threshold for exposure allowed by the OSHA occupational exposure standard is 100 W/sq m for exposure durations of 6 minutes or more.

PB-257 138/8GA PC$4.50/MF$3.00
Office of Radiation Programs, Silver Spring, Md. Electromagnetic Radiation Analysis Branch.
An Evaluation of Selected Satellite Communication Systems as Sources of Environmental Microwave Radiation,
Norbert N. Hankin. Dec 74, 67p* EPA/520/2-74/008

Descriptors: *Radiation hazards, *Microwave relay systems, *Microwave antennas, Microwave communication, Microwaves, Communication satellites, Radiant flux density.
Identifiers: Power density, Ground stations, Communication satellite terminals, AN/TSC-54, AN/MSC-60.

Selected satellite communication (SATCOM) systems are evaluated analytically and, for some of these systems, through measurement of the microwave radiation power densities generated by them. The evaluation is directed toward assessing the radiation exposure hazards which exist for specific systems and generally for SATCOM systems as a class of high power nonionizing radiation source. The paper includes determinations of anticipated maximum power density levels as functions of distance from the source, a description of the analytical method used, and the results of measurements of the power densities produced by certain SATCOM systems. Included also is a discussion of potential hazard analysis and its uses in identifying systems which may constitute environmental hazards.

6S. Stress Physiology

AD-A029 180/7GA PC$4.00/MF$3.00
Payne Inc Annapolis Md
Wind Tunnel Measurements of Vertical Acting Limb Flail Forces and Torso/Seat Back Forces in an ACES-II Ejection Seat.
Final rept. 18 Nov 75-31 Mar 76,
Fred W. Hawker, and Anthony J. Euler. Jun 76, 31p Working paper-148-7, AMRL-TR-76-3
Contract F33615-75-C-5096

Descriptors: *Ejection seats, *Escape systems, *Wounds and injuries, *Aviation medicine, *Extremities, Flight crews, Aircraft, Arms(Anatomy), Legs, Hands, Feet, Aerodynamic lift, Aerodynamic loading, Loads(Forces), Human body, Wind tunnel tests.
Identifiers: *Flail injury, ACES-2 Ejection seat, *Flail injuries.

In the study of flail injury (References 4 and 5) it is important to know the magnitude of the forces tending to pull a crew member's limbs away from their 'stowed' position, when he first ejects into the windblast. Earlier wind tunnel studies did not record the limb lift component force for the hands or feet. These forces, along with the drag force between the occupant and the seat, were measured in this investigation, for the range of pitch and yaw angles used in the previous investigations of other force components. The results and their implications are presented and discussed. (Author)

AD-A029 203/7GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
A Comparison of the Perceived Intensity of Sinusoidal and Multifrequency Whole-Body Vibration.
Technical rept.,
Richard W. Shoenberger. Jun 76, 14p Rept no. AMRL-TR-76-1

Descriptors: Human factors engineering, *Vibration, Perception(Psychology),Biodynamics, Response(Biology), Intensity, Measurement, Sine waves.
Identifiers: Sinusoidal vibration, Multifrequency vibration, *Stress(Physiology).

Existing standards for human exposure to whole-body vibration are based heavily on data from experiments in which the vibration inputs were single sinusoids. An intensity matching technique was used to test the independent component method for evaluating complex vibration environments composed of multiple sine waves. Ten subjects adjusted the intensity of a 25 Hz sinusoid to match the subjective intensity of 11, 17, 40, and 63 Hz sinusoids (all with intensities at the same criterion level), presented either singly or in all possible combinations of two, three or four frequencies. The results showed a monotonic relationship between perceived intensity and the number of sinusoids in the stimulus (i.e., the acceleration of the matching response increased significantly as the number of sinusoids increased). These findings indicate (at least for the frequency range sampled) that the 'independent frequency' method of evaluating non-sinusoidal vibrations will underestimate the severity of such complex vibration environments.

AD-A029 496/7GA PC$3.50/MF$3.00
Naval Medical Research and Development Command Bethesda Md
Enhancement of Base Pair Substitution Induced by Alkylating Mutagens in Simulated Hyperbaric Diving Environments,
James Robert Wild. 12 Sep 75, 12p
Availability: Published in Mutation Research, v38 p259-270 1976.

Descriptors: *Mutations, *Hyperbaric conditions, Helium, Mutagens, Salmonella typhimurium, Simulation, Hydrostatic pressure, Histidine, Rare gases, Oxygen, Growth(Physiology), Death, Reprints.
Identifiers: N-Methyl-N-Nitro-N-Nitrosoguanidine.

The effect of simulated saturated diving environments on mutagenicity was investigated using two histidine auxotrophs (hisG46 and hisTA1950 derived by Ames from Salmonella typhimurium LT2) exposed to several chemical mutagens. In agar diffusion tests with impregnated paper discs, 68 atm of normoxic supporting gases (containing 0.2 atm O2) reduced the number of histidine revertants of auxotrophs exposed to N-methyl-N-nitro-N-nitrosoguanidine (NTG) and two other alkylating agents. The effect was induced in increasing order by helium, a mixture of neon and helium, nitrogen and argon. The effect of the gases on the growth of the two strains was small and did not explain the reduction of revertant recovery. On the other hand, it was shown that NTG in concentrations of 0.6 to 250 micrograms/ml was significantly more lethal for the hisG46 strain under 68 and 136 atm than at 1 atm.

6T. Toxicology

AD-A029 194/8GA PC$3.50/MF$3.00
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Topical Hazard Evaluation Program Study.
Rept. for May 75-Jun 76,
K. Clark Swentzel. 31 Aug 76, 9p Rept no. USAEHA-51-112-75/76

Descriptors: *Insect repellents, *Toxicity, *Irritant compounds, Hazards, Bioassay, Laboratory animals, Rabbits, Rats, Guinea pigs, Skin(Anatomy), Eye, Ingestion(Physiology).
Identifiers: Recommendations.

AI3-36387 was evaluated using New Zealand white rabbits for skin and eye studies, Hartley guinea pigs for a skin sensitization study and Sprague-Dawley, Wistar-derived rats for determination of oral toxicity. No further testing is planned for AI3-36387 because of topical injury produced.

AD-A029 197/1GA PC$3.50/MF$3.00
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Topical Hazard Evaluation Program Study.
Rept. for May 75-Jun 76,
Richard A. Angerhofer. 1 Sep 76, 10p Rept no. USAEHA-51-119-75/76

Descriptors: *Insect repellents, *Toxicity, *Irritant compounds, Hazards, Bioassay, Laboratory animals, Rabbits, Rats, Guinea pigs, Skin(Anatomy), Eye, Ingestion(Physiology).
Identifiers: Recommendations.

AI3-36412 was evaluated using New Zealand White rabbits for skin and eye studies, Hartley guinea pigs for a skin sensitization study and Sprague-Dawley, Wistar-derived rats for determination of oral toxicity. It was recommended that AI3-36412 be approved for further testing as a candidate repellent.

PB-255 721/3GA PC$4.50/MF$3.00
Ohio State Univ., Columbus. Water Resources Center.
Studies on the Toxicity of Ammonia, Nitrate and Their Mixtures to the Common Guppy,
Alan J. Rubin, and M. A. Elmaraghy. Jun 76, 54p 490, W76-10811, , OWRR-A-033-OHIO(1)
Prepared by Ohio State Univ., Columbus. Dept. of Civil Engineering.

Descriptors: *Toxicity, *Ammonia, *Inorganic nitrates, *Fishes, Potassium nitrate, Bioassay, Toxicology, Lethal dosage, Kinetics, Aquatic animals, Water pollution, Evaluation, Tolerances(Physiology), Tables(Data), Experimental data, Thresholds(Perception).
Identifiers: *Water pollution effects(Animals), *Poecilia reticulatus, Maximum permissible exposure.

Common guppies were raised under controlled conditions. The toxicities of ammonia and potassium nitrate solutions to their fry were estimated by establishing the 24 and 96 hour

median tolerance limits. Then the joint toxicity of the two were estimated at different NH3/NO3 ratios. The toxicities are additive. Evaluated also was the applicability of several disinfection laws to fish toxicity. These included the equations of Chick, Watson, Hom, and Chen and Selleck.

PB-256 659/4GA PC$3.50/MF$3.00
Midwest Research Inst., Kansas City, Mo.
Toxicity Studies of Selected Chemicals. Task I: The Developmental Toxicity of Ethylene Dibromide Inhaled by Rats and Mice During Organogenesis.
Final rept.,
Robert D. Short, Jr., Jan L. Minor, Brett Ferguson, Timothy Unger, and Chen-Chun Lee. Apr 76, 15p EPA/560/6-76/018
Contract EPA-68-01-3242

Descriptors: *Toxicity, *Congenital abnormalities, *Bromides, Ethane, Scavengers(Materials), Degassers, Fumigation, Rats, Mice, Laboratory animals, Respiration, Embryos, Exposure, Bioassay, Toxicology.
Identifiers: Ethane/dibromo, *Toxic substances, Teratogenesis, Birth defects.

The purpose of this study was to determine the teratogenic potential of ethylene dibromide (EDB) inhaled by rats and mice during organogenesis. This report describes the effects of ethylene dibromide (inhaled at a concentration of 32 ppm for 23 hr a day from gestational day 6 through 15) on fetal development.

PB-256 860/8GA PC$10.75/MF$3.00
IIT Research Inst., Chicago, Ill. Life Sciences Div.
Preclinical Toxicologic Evaluation of Dihydroimidazopyrazole (NSC-51143) in Mice, Dogs and Monkeys.
Final rept. 3 Nov 75-29 Mar 76,
M. C. Henry, C. D. Port, A. M. Guarino, R. D. Davis, and D. M. Young. 25 Jun 76, 400p IITRI-L6087-1, IITRI-TOX-51143-76-1
Contract N01-CM-4-3746
Prepared for Battelle Columbus Toxicology Program Office, McLean, Va.

Descriptors: *Antineoplastic agents, *Toxicology, Neoplasms, Drugs, Laboratory animals, Bioassay, Pathology, Hematology, Blood chemical analysis, Dosage, Dose rate, Dosage forms, Lethal dosage, Permissible dosage, Sublethal dosage, Parenteral infusions, Toxicity, Experimental design, Tables(Data), Chemical properties, Pyrazoles, Nitrogen heterocyclic compounds.
Identifiers: *Pyrazole/dihydro-imidazo, Cancer, Baseline measurement.

The combined IV LD50 in BDF1 mice was 2980 mg/sq.m. The major target organs in mice, dogs and monkeys were the liver, kidney, lymphoid tissue and bone marrow, and the GI tract was also involved in dogs and monkeys. Dose-related changes in dogs and monkeys were observed in hematology (anemia, reticulocytosis, neutrophilia, leukopenia), and blood chemistry (increased BUN, creatinine, SGOT, SGPT, alkaline phosphatase, bilirubin and BSP retention). The immediate toxic effects were on erythrocytes with supression of lymphoid elements occurring later. In dogs, the most toxic schedule was single push injection; attenuation of toxic response occurred when rest periods were introduced between single or repeated doses. The monkey was the more sensitive of the large animal species.

PB-256 922/6GA PC$4.00/MF$3.00
Stanford Research Inst., Menlo Park, Calif. Life Sciences Div.
Light and Electron Microscopy of Dogs' Lungs After Long-Term Exposure to Ozone.
Final rept.,
Gustave Freeman, Robert J. Stephens, D. L. Coffin, and Jerry F. Stara. 15 Jul 72, 27p
Contract EPA-68-02-0302

Descriptors: *Lung, *Ozone, *Toxicology, Histology, Pathology, Dogs, Laboratory animals, Exposure, Microscopy, Electron microscopy, Phagocytes, Lymphocytes, Leukocytes, Cells(Biology), Dosage, Experimental data.

Female beagle dogs were exposed for about 18 months to 1 ppm of ozone in air for either 8, 16, or 24 hours per day and to 2 or 3 ppm for 8 hours a day. The earliest evidence of response was the appearance of macrophages in and around the respiratory bronchiolar-ductal region and in the adjacent alveoli. The macrophages increased with the 'dosage,' the maximum concentrations being associated with 3 ppm for 8 hours per day. Although fibrous tissue elements were only rarely deposited at the lowest dosage, deposition became evident in occasional alveolar ducts following exposure for 16 hours daily to 1 ppm, and increased as the concentration of ozone rose. Features more apparent at the higher concentrations were thickening of the terminal and respiratory bronchiolar walls and their infiltration, by lymphocytes and some plasma cells and 'fibroblasts' that formed peribronchiolar collars of cells. Strands of connective tissue which contributed to the narrow alveolar openings in the respiratory bronchioles and in the alveolar ducts, extended into the attached alveolar walls. Bronchiolar walls, thickened by infiltration with cells and deposition of connective tissue, reduced the caliber of small airways.

PB-257 139/6GA PC$3.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Toxic Substances.
Core Activities of the Office of Toxic Substances (Draft Program Plan).
Final rept.
Jul 76, 22p EPA/560/4-76/005

Descriptors: *Industrial wastes, Chemical compounds, Toxicology, Pollution, Environments, Identifying, Hazards, Public health.
Identifiers: *Toxic substances, *Environmental health, Government agencies.

The report describes a variety of efforts to identify, characterize, and reduce environmental problems associated with toxic chemicals.

PB-257 185/9GA PC$7.50/MF$3.00
Franklin Inst. Research Labs., Philadelphia, Pa.
Chlorinated Hydrocarbon Toxicity (1,1,1-Trichloroethane, Trichloroethylene and Tetrachloroethylene): A Monograph.
Final rept. 1920-75,
Paul Walter, Arthur Craigmill, Jon Villaume, Shirley Sweeney, and G. L. Miller. 5 May 76, 178p* CPSC/BBSC-76/M1
Contract CPSC-C-75-0100

Descriptors: *Toxicity, *Tetrachloroethylene, *Chlorine organic compounds, *Industrial medicine, *Organic solvents, Consumers, Industry, Physical properties, Chemical properties, Solvents, Chemical analysis, Utilization, Water pollution, Toxicity, Biochemistry, Enzymes, Drugs, Bibliographies, Air pollution, Gas analysis, Chemical analysis, Industrial hygiene, Gas chromatography, Laboratory animals, Experimental design, Carcinogens, Concentration(Composition), Bibliographies.
Identifiers: *Ethylene/trichloro, *Ethane/trichloro, Indoor air pollution, Air pollution effects(Humans), Occupational health and safety.

Results of a study of the 1920-1975 literature on three chlorinated hydrocarbons are presented and evaluated. For each chemical, the following is provided and keyed to references in the literature: summary; physical and chemical properties; analytical methods; occurrence; use by industry; use in consumer products; breakdown; short-term toxicological studies; long-term toxicological studies; absorption-distribution; metabolism-excretion; effects on enzymes; and drug interactions. 91 references.

PB-257 269/1GA PC$4.50/MF$3.00
Ohio State Univ., Columbus. Dept. of Veterinary Physiology and Pharmacology.
Acute Cardiovascular Effects of Diglycoaldehyde (NSC-118994) Following Single Bolus Intravenous Injections to Anesthetized Beaglehounds.
Final rept. 25 Mar 76-21 Apr 76,
R. L. Hamlin, F. S. Pipers, K. Nguyen, P. Mihalko, and R. M. Folk. 13 Jul 76, 58p OSU-RHFP-118994-76-8
Prepared for Battelle Columbus Toxicology Program Office, McLean, Va., Contract N01-CM-43746. See also report dated 10 Nov 75, PB-254 767.

Descriptors: *Antineoplastic agents, *Toxicology, *Cardiovascular system, *Drugs, Toxicity, Bioassay, Dogs, Dosage, Dose rate, Lethal dosage, Permissible dosage, Sublethal dosage, Pathophysiology, Heart rate, Respiration, Body temperature, Parenteral infusions, Aldehydes.
Identifiers: Cancer, *Diglycoaldehyde.

Acute cardiovascular effects of diglycoaldehyde were monitored in healthy, anesthetized beaglehounds. Bolus injections of 0, 100, 150, and 200 mg compound/kg were made intravenously in three dogs; and records of cardiovascular parameters were made at 5, 20, 40 and 60 minutes after injection also, at 80, 100 and 120 minutes after injection. One dog died 20 minutes after the highest dose, and all others survived the 60-minute or 120-minute surveillance. General cardiovascular responses were: an increase in heart rate, respiratory rate, systemic vascular resistance and amplitude of T-waves; and a decrease in body temperature, systemic arterial blood pressure, cardiac output, QT interval and left ventricular contractility (in 3 dogs receiving the highest dose). The changes of significance may be homeostatic responses to slight myocardial depression and marked decrease in stroke volume. It appears that diglycoaldehyde exerts little cardiovascular effect of significance when given at 100 or 150 mg/kg; but that at 200 mg/kg the effects are much more profound and led to death in one out of 6 dogs.

7. CHEMISTRY

7A. Chemical Engineering

PATENT-3 975 178 Not available NTIS
Tennessee Valley Authority, Muscle Shoals, Ala.
Purification of Wet-Process Phosphoric Acid with Methanol and Ammonia.
Patent,
John F. McCullough, and Leland L. Frederick. Filed 28 May 74, patented 17 Aug 76, 14p PB-257 018/2, PAT-APPL-473 947
Continuation of PAT-APPL-406 103, filed 12 Oct 73.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Phosphoric acids, *Purification, *Patents, Precipitation(Chemistry), Complex compounds, Separation, Fertilizers, Manufacturing.
Identifiers: Wet methods, PAT-CL-71-34.

The invention relates to an improved process for the partial purification of wet-process

phosphoric acid with co-production of impure phosphoric acid or solid fertilizer materials containing most of the impurities originally present in the crude acid. The crude acid is treated with methanol and ammonia to precipitate most of the metallic and fluorine impurities as solid ammonium metallic phosphates and fluorine compounds that filter and settle rapidly. The solids are separated from the reaction mixture and methanol is distilled from the resulting clarified solution to form concentrated partially purified acid. The solid ammonium metallic phosphates are fertilizer materials. Alternately, the reaction slurry is separated into a clarified liquid fraction and a settled slurry fraction. Methanol is distilled from the settled fraction which causes most of the impurities to redissolve yielding an impure phosphoric acid.

PB-255 242/0GA PC$3.50/MF$3.00
Pacific Environmental Services, Inc., Santa Monica, Calif. Environmental Engineering Dept.
SO2 Control Plan Analysis for Kennecott Copper Corporation, Utah Division.
Final rept.,
I. J. Weisenberg. Dec 74, 24p 046
Contract EPA-68-02-1354

Descriptors: *Sulfur dioxide, *Air pollution control, Modifications, Cost estimates, Combustion products, Reliability, Converters, Performance evaluation, Efficiency, Catalysts, Concentration(Composition).
Identifiers: *Kennecott Copper Corporation, *Copper smelters.

Contents:
- Background and Summary;
- Approaches and Alternatives;
- Special Considerations--(Factors affecting efficiency, Combining plants 6 and 7 to form a double-contact system, Reliability of double- versus single-contact plant);
- Cost;
- Meeting with Kennecott Copper Corp., Utah Copper Division, Salt Lake City, Utah to Review Acid Plant Plans.

PB-256 311/2GA PC$4.50/MF$3.00
Air Pollution Technology, Inc., San Diego, Calif.
Johns-Manville CHEAF Evaluation.
Final rept. Nov 74-Jun 75,
Seymour Calvert, Joel Rowan, and Charles Lake. Jul 75, 55p EPA/650/2-75/058-a
Contract EPA-68-02-1496

Descriptors: *Air pollution control equipment, *Particles, *Air filters, Design criteria, Fines, Efficiency, Performance evaluation, Particle size, Impactors, Cost estimates, Concentration(Composition), Tables(Data), Graphic methods, Scrubbers.
Identifiers: Cleanable high efficiency air filter, Wet methods, Dry methods.

The report gives results of an evaluation of the Johns-Manville CHEAF system for controlling particulate emissions. Fine particulate collection efficiency as a function of dry particle size was computed from data taken on the CHEAF system, a system used to control emissions from a diatomaceous earth calcining and drying process with an overall collection efficiency of 95%. The unit was operating at a capacity of 710 A cu m/min (25,000 acfm), at 63C (145F), with a pressure drop of approximately 50-53 cm (19.5-21 inches) water column. Initial tests showed inlet and outlet size distributions to be identical with a mass mean diameter of 0.82 micrometers A and a geometric standard deviation of 3.9. The data analysis indicates that particle penetration is relatively independent of particle diameter. Further tests revealed that particle growth occurs prior to the CHEAF system. Simultaneous heated and unheated impactor runs provided dried particle size distribution and actual (or wet) size distribution existing inside the scrubber, respectively. Particle growth was then determined, showing that particles grew as much as three times their original size in the submicron range, and less for larger sizes. This particle growth to a more uniform size can explain why penetration is relatively independent of inlet dry particle size.

PB-256 358/3GA PC$5.00/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Research.
Evaluation of a Muffle Furnace Procedure for Determining Percent Ash and Percent Weight Loss on Heating of Solid Wastes.
Open-file rept.,
Nancy S. Ulmer. 1971, 78p SWR-101

Descriptors: *Solid wastes, *Fly ash, *Muffle furnaces, Samples, Performance evaluation, Accuracy, Precision, Modifications, Design criteria, Ignition, Thermogravimetry, Carbonates.

An investigation of the American Public Works Association's tentative method for the determination of the ash and volatile solids of solid wastes is described. The applicability of specific variations in the procedural directions or conditions are presented as well as the accuracy, precision, and applicability of a modification of the procedure. Utilization of the modified technique and the substitution of the term, weight loss on heating, for the term, volatile solids, are proposed.

PB-256 572/9GA PC$7.50/MF$3.00
Burns and Roe Industrial Services Corp., Paramus, N.J.
VTE/MSF Module - Fountain Valley Test Facility.
Annual rept. 1 Jul 75-30 Apr 76.
Apr 76, 191p W76-11325, , OWRT/S-76/51
Contracts DI-14-30-3164, DI-34-0001-6518

Descriptors: *Desalting, Sea water corrosion, Distillation, Pilot plants, Performance evaluation, Process charting, Heat transfer, Brines, Copper oxides, Calcium sulfates, Sulfites, Oxygen, Reaction kinetics, Evaporators, Deaerators, Carbonates, Carbon dioxide, Numerical analysis, Fouling, Calcium oxides, Alkalinity, Modifications, Antifoaming agents, Dissolved gases, Noise(Sound), Tables(Data), Computer programs.
Identifiers: *Desalination plants, *Multistage flash distillation, *Verticle tube evaporation, Heavy metals, Fountain Valley(California), Copper oxide(Cu2O).

This is the final report on operation and developmental activities on the VTE/MSF sea water desalting test module at Fountain Valley, California. Because of severe noise, emitted primarily from the boiler area, module operations were restricted to daylight hours, five (5) days a week. Technical data were collected in four (4) modes of operation. Extensive heat transfer data were collected over a temperature range of 110F to 220F and new design equations were developed for the combined VTE/MSF process. Heat transfer coefficients for all four (4) VTE bundles are given. Heat exchanger tube corrosion rates are given for all operating modes. Calcium sulfate and cuprous oxide caused fouling in the VTE bundles.

PB-256 689/1GA PC$6.00/MF$3.00
GCA Corp., Bedford, Mass.
Laboratory Evaluation of the Cleanable High Efficiency Air Filter (CHEAF).
Final rept.,
Manuel T. Rei, and Douglas W. Cooper. Jul 76, 133p GCA-TR-76-9-G, EPA/600/2-76/202
Contract EPA-68-02-1487

Descriptors: *Air pollution control equipment, *Particles, *Scrubbers, *Air filters, Aerosols, Fines, Iron oxides, Concentration(Composition), Impactors, Condensation nuclei, Design criteria, Performance evaluation, Cellular plastics, Particle sizes, Numerical analysis, Polyurethane resins, Comparison, Efficiency.
Identifiers: Point sources, Wet methods, Cleanable high efficiency air filter.

The report gives results of testing a novel scrubber, the Cleanable High Efficiency Air Filter (CHEAF), as part of a program to identify novel high efficiency fine particle control devices. The scrubber was tested at room temperature, using iron oxide aerosols of concentrations near 0.2 g/cu m (0.1 grain/cu ft), mass median aerodynamic diameter of 1.1 micrometers. Inlet and outlet samples were taken with cascade impactors, total mass filters, a condensation nuclei counter, and an optical particle counter. These tests were performed with different filter media, at different face velocities, and at different water spray rates and water recycle rates. Efficiency increased with increases in: foam pores per inch, pressure drop, flow rate, spray rate, and make-up water addition. The results were consistent with the hypothesis that impaction is the major collection mechanism and re-entrainment contributes substantially to penetration. Total mass efficiency was approximately 95 percent at normal conditions, for which the pressure drop across the CHEAF was 80 cm (31.5 inches) WC. The particle aerodynamic cut diameter, for which the efficiency would be 50 percent at these conditions, was determined from cascade impactor data to be below 0.5 micrometer. This indicates that the 50 percent cut diameter for the CHEAF is smaller than for a venturi scrubber operating at the same pressure drop.

7B. Inorganic Chemistry

AD-A029 353/0GA PC$3.50/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Propulsion Directorate
Solid Propellants for Generating Hydrogen.
Technical rept.,
Orval E. Ayers, James Murfree, Pasquale Martignoni, and William M. Chew. 20 Apr 76, 17p Rept no. RK-76-11

Descriptors: *Solid propellants, *Hydrogen, *Deuterium, Chemical lasers, *Gas generating systems, Sodium borohydrides, Ammonium compounds, Sulfates, Iron oxides, Chemical reactions, Purity.

Solid propellants have been developed and evaluated in a hydrogen gas generator as potential sources of hydrogen for the hydrogen fluoride/deuterium fluoride chemical laser. Formulations based on the reaction of sodium borohydride (NaBH4) with ferric acid (Fe2O3) to produce high purity hydrogen and the reaction of NaBH4 with (NH4)2SO4 to produce a mixture of hydrogen and nitrogen have been investigated. When deuterated compounds are used in place of the hydrogen-containing compounds, deuterium (D2) is generated in place of hydrogen (H2). Propellant grains of NaBH4/Fe2O3 weighing approximately 0.06 kg have been prepared and used to generate high purity hydrogen gas for use as a laser cavity fuel and precombustor fuel in a small hydrogen fluoride/deuterium fluoride chemical laser device. The propellant formulations that contain NaBH4 are very stable to moisture, exhibit no sensitivity to impact or friction, and have autoignition temperatures above 773 K. These propellants or similar type solid propellants are potential storable H2/D2 gas sources that combine instant readiness with excellent handling characteristics and compact storage. The volumetric efficiency of these solid propellants is equivalent to or greater than that of liquid hydrogen as a source of gaseous hydrogen. Experimental data from the hydrogen

fluoride/deuterium fluoride chemical laser tests confirm that hydrogen produced from a solid propellant grain is equivalent to commercial hydrogen for use as a cavity or precombustor fuel in the hydrogen fluoride/deuterium fluoride chemical laser. (Author)

7C. Organic Chemistry

PAT-APPL-696 238/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Vinyl Polymerization Initiator and Reducing Agent.
Patent Application,
Oh-Kil Kim. Filed 15 Jun 76, 18p AD-D002 886/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Polymerization, *Olefin polymers, Synthesis(Chemistry), Vinyl radicals, Explosives, Handling, Acrylonitrile polymers, Acrylates, Styrenes, Detergents, Halogenated hydrocarbons.
Identifiers: *Patent applications, PAT-CL-252-438, *Reducing agents, Polymerization initiators, Acrylamide copolymers, Micelles.

The patent application relates to an olefinic polymerization initiator comprising a micellar complex of a micell-forming detergent selected from the class consisting of C10 to C18 aliphatic-trimethylammonium bromide, C10 to C18 aliphatic-trimethylammonium chloride, hexadecyl pyridinium bromide, and hexadecyl-pyridinium chloride, and a bisulfite in a detergent-to-bisulfite mole ratio from 1:2 to 50:1.

PATENT-3 957 672 Not available NTIS
Department of the Navy Washington D C
Displacement of Organic Liquid Films from Solid Surfaces by Non Aqueous Systems.
Patent,
William A. Zisman, and Marianne K. Bernett.
Filed 23 Nov 73, patented 18 May 76, 6p AD-D002 897/7, PAT-APPL-418 347
Supersedes AD-D002 040.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthesis(Chemistry), *Fluoropolymers, Ethers, Displacement, Surfaces, Fluorinated hydrocarbons, Cleaning compounds.
Identifiers: *Freon E series fluorocarbon, Freons, PAT-CL-252-171, Surfactants.

A non-aqueous liquid surface-active composition is described for displacing aqueous or organic liquid films from solid surfaces. The composition contains fluorinated polyethers having the formula CF3CF2CF2(OCF(CF3)CF2)nO CHFCF3 and may include a fluoro-alcohol, or a fluoro-acid a fluorinated diester solute and/or a fluorinated benzene solvent, fully fluorinated bromo- and chloro-alkane solvent or a perfluoroalkane solvent.

PATENT-3 966 729 Not available NTIS
Department of the Air Force Washington D C
Addition Curable Phenyl-Quinoxaline Compositions and Their Synthesis.
Patent,
Robert F. Kovar, and Fred E. Arnold. Filed 19 May 75, patented 29 Jun 76, 9p AD-D002 857/1, PAT-APPL-578 846
Supersedes AD-D000 824.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Heat resistant plastics, *Patents, *Synthesis(Chemistry), Curing, Nitrogen heterocyclic compounds, Polymers.
Identifiers: *Polyquinoxalines, Quinoxalines, PAT-CL-260-250, Diamines, Endcapping agents.

An aromatic bis(o-diamine) is reacted with an aromatic bisbenzil to provide a benzil end-capped quinoxaline oligomer which is then reacted with 4-(3-ethynylphenoxy)orthophenylene diamine to give an ethynyl terminated polyquinoxaline. Because the polyquinoxalines can be cured to provide thermally stable polymer compositions having superior mechanical properties, the compositions are particularly suitable for use in the fabrication of reinforced composite structures.

PB-256 377/3GA PC$3.50/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Research.
Determination of the Phosphate in Solid Waste Using the Vanadomolybdophosphoric Acid Method.
Open-file rept.,
William H. Kaylor. 1971, 15p SWR-130

Descriptors: *Solid wastes, *Phosphates, Chemical analysis, Experimental design, Materials recovery, Fertilizers, Concentration(Composition), Coulometers, Nutrients.
Identifiers: *Vanadomolybdophosphoric acid analysis.

The reclamation of useful products from solid waste is one method of reducing the disposal problem of solid wastes. There are many research projects concerned with recycling solid wastes into fertilizers and food products. This report describes and evaluates one method for measuring phosphorus in the form of phosphates that are precent in solid wastes. The vanadomolybdophosphoric acid method was selected to be investigated as a method for solid waste analyses because of its high range, simplicity, and freedom from interferences. The chemistry which makes this method useful for determining phosphates is believed to involve the substitution of oxyvanadium and oxymolybdenum radicals for the O of PO4 to give a heteropoly compound that is chromogenic. The intensity of yellow color produced is proportional to the concentration of phosphates present; thus the phosphates can be determined colormetrically by measuring the intensity of the yellow color produced when PO4 comes in contact with vanadate and molybdate in an acid solution.

7D. Physical Chemistry

AD-A029 222/7GA PC$3.50/MF$3.00
Wisconsin Univ Madison
A Photoionization Study of Cluster Species Present in Gas Vapors and Those Created by Condensation in a Supersonic Molecular Beam.
Interim rept. 1 May 75-30 May 76,
James W. Taylor. 15 Jul 76, 9p Rept no. N00014-75-C-0943-1
Contract N00014-75-C-0943

Descriptors: *Clustering, *Carbon dioxide, *Carbinols, *Molecular beams, Mass spectrometry, Photoionization, Nucleation, Condensation, Supersonic flow.

This interim report summarizes the effort over the past 13 months to characterize the clusters of carbon dioxide and those of methanol which are either formed or sampled by a supersonic molecular beam. Instrumental conditions were characterized and quantitative measurements were attempted to produce the heats of formation and the intensities of cluster species using photoionization mass spectrometry. (Author)

AD-A029 233/4GA PC$4.00/MF$3.00
California Univ San Diego La Jolla Dept of Physics
Theory of Helium Adsorption on Simple and Noble Metal Surfaces.
Technical rept.,
E. Zaremba, and Walter Kohn. Aug 76, 44p Rept no. TR-36
Contract N00014-76-C-0050

Descriptors: *Helium, *Adsorption, *Metals, Atoms, *Surfaces, Interactions, Hartree-Fock approximation, Rare gases, Precious metals.
Identifiers: Wave functions.

The repulsive part of the helium-metal physisorption potential is calculated in the Hartree-Fock approximation. To the lowest order in the overlap (S) between the atomic and metallic wavefunctions, this interaction is determined by the change in the single-particle density of states of the metal. Combined with a previous calculation of the van der Waals interaction, helium-metal potentials are derived for the simple and noble metals using a jellium model for the metal. Binding energies and equilibrium positions of the helium atom are determined. For the simple metals, the binding energy decreases with increasing r sub s. Its value for the noble metals is between 40 - 70 K. The equilibrium positions are found to be between 3 and 7 A (relative to the jellium background) for all the metals studied. (Author)

AD-A029 261/5GA PC$4.00/MF$3.00
Technische Universitaet Munich (West Germany) Institut Fuer Physikalische Und Theoretische Chemie
Two-Photon Spectroscopy in the Gas Phase. II. Assignments of Molecular Transitions: Benzene.
Final rept. 1 Jun 75-31 May 76,
E. W. Schlag, L. Wunsch, F. Metz, and H. J. Neusser. 31 May 76, 31p EOARD-TR-76-004
Grant AF-AFOSR-2834-75

Descriptors: *Benzene, *Molecular energy levels, Photons, Excitation, Performance tests, Polarization, Chemical analysis, Band spectra.
Identifiers: *Two photon absorption spectra, Vibronic spectra, Rotational spectra.

The authors' two-photon work on benzene has produced a rich spectrum, on the basis of which they were able to make the first assignment for this molecule, based on two-photon spectroscopy. In fact this is the first polyatomic molecule assigned by this method. The authors have also completed an extensive theory paper which includes rotational effects in two-photon theory. Previously they have shown that ignoring this effect can, and has, lead to misassignments in the spectra. From the rotational envelopes, one can calculate the Coriolis constants directly. The submitted papers are included as part of this report.

AD-A029 285/4GA PC$3.50/MF$3.00
Liege Univ (Belgium)
Sustainer Enhancement of the VUV Fluorescence in High-Pressure Xenon.
Journal article,
Ernest E. Huber, Jr., Edward V. George, Lawrence R. Jones, and Robert M. Lerner. 16 Dec 75, 8p JA-4568, ESD-TR-76-194
Contract F19628-73-C-0002
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE12 n6 p353-359 Jun 76.

Descriptors: *Vacuum ultraviolet radiation, Xenon lasers, Fluorescence, *Xenon, High pressure, Electron beams.
Identifiers: Reprints, Belgium.

No abstract available.

AD-A029 294/6GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Chemistry

The Elastic Free Energy and the Elastic Equation of State: Elongation and Swelling of Polydimethylsiloxane Networks,
Paul J. Flory, and Yoh-Ichi Tatara. 23 Oct 74, 22p AFOSR-TR-76-0907
Grant AF-AFOSR-2441-73
Availability: Pub. in Jnl. of Polymer Science: Polymer Physics Edition, v13 p683-702 1975.

Descriptors: *Free energy, *Polymers, Equations of state, Stress strain relations, Elongation, Chemical equilibrium, Loads(Forces), Interactions, Solvents, Reprints.
Identifiers: *Silicone resins, Poly(siloxane/dimethyl).

Experiments are reported on the dependence of the equilibrium retractive force on elongation for cross-linked polydimethylsiloxanes (PDMS) exposed to benzene or hexamethyldisiloxane vapor at regulated activities. The results of Allen, Kirkham, Padget, and Price on the elastic behavior of natural rubber are discussed, with particular reference to the coefficients of dilation with elongation which they determined at fixed composition. The present results lend strong support to the principle of additivity of the free energies attributable to the network and to the bulk liquid system, respectively.

AD-A029 298/7GA PC$3.50/MF$3.00
Georgetown Univ Washington D C Dept of Chemistry
The Effect of Quasispherical Solutes on the Nematic to Isotropic Transition in Liquid Crystals,
D. E. Martire, G. A. Oweimreen, G. I. Agren, S. G. Ryan, and H. T. Peterson. 8 Oct 75, 10p ARO-6425.17-C
Grant DA-ARO-D-31-124-73-G2
Availability: Pub. in Jnl. of Chemical Physics, v64 n4 p1456-1463, 15 Feb 76.

Descriptors: *Liquid crystals, *Transition temperature, Impurities, Phase studies, Binary compounds, Mixtures, Isotropism, Reprints.
Identifiers: *Nematic liquid crystals.

When nonmesomorphic solutes are added to nematic liquid crystals, the nematic-isotropic transition temperature is depressed an a two-phase region is observed. The slopes Beta(n) and Beta(i) of the nematic and isotropic phase boundary lines in the reduced nematic-isotropic transistion temperature (T*) vs solute mole fraction (x) diagrams are reported for binary mixtures of quasispherical solutes with nematic liquid crystals. The systems studied are Me4Sn, Et4C, Et4Sn, Pr4Sn, Bu4Pb, and Bu4Sn (Me = methyl, Et -ethyl, Pr = propyl, and Bu = butyl), mixed with p-methoxybenzylidene-p-n-butylaniline (MBBA), and CCl4 mixed with p-p-di-n-hexyloxyazoxybenzene(DHAB). Also reported are infinite dilution solute activity coefficients for several mixtures involving Et4C and CCl4. The experimental results are compared with predicted values from statistical-mechanical theories based on (a) a lattice model of hard rectangular parallelpipeds and cubes, (b) a virial expansion treatment of hard spherocylinders and spheres, and (c) a proposed modification of a mean field treatment (Maier-Saupe type) of axially symmetric and spherical molecules. All three models correctly predict the observed trend of increasing Beta(n) and Beta(i) with increasing solute size and yield predicted slopes which are at least within a factor of 2 of the experimental slopes.

AD-A029 299/5GA PC$3.50/MF$3.00
State Univ of New York at Buffalo Dept of Geological Sciences
The Dissolution Kinetics of Feldspars at 25 C and 1 atm CO2 Partial Pressure,
Eurybiades Busenberg, and Charles V. Clemency. 17 Dec 74, 10p ARO-11161.4-EN
Grant DA-ARO-D-31-124-73-G141
Availability: Pub. in Geochimica et Cosmochimica Acta, v40 p41-49 1976.

Descriptors: *Feldspar, *Weathering, *Plagioclase, *Reaction kinetics, Dissociation, Potassium, Aluminum, Silicon, Magnesium, Iron, Sodium, Ion exchange, Reprints.
Identifiers: Dissolving.

The dissolution kinetics of 5% by weight suspensions of two potassium feldspars and six plagioclases were studied for 400-1200hr at 1 atm P(CO2). At frequent intervals, the pH of the stirred suspensions were measured in the reaction cell as the solutions were sampled. The filtered aqueous samples were acidified and then were analyzed for Si. Al, K, Na, Ca, Mg, and Fe. The following sequence of events were recognized in the artificial weathering of all the feldspars: (1) an initial ion exchage stage lasting approximately 1 min during which the surface cations were replaced by hydrogen ions form the bulk solution, (2) an up to 4 day nonparabolic stage characterized by the very rapid release of cations and silicic acid into the bulk solution, (3) a diffusion-controlled parabolic stage lasting approximately 19 days and (4) a steady-state stage characterized by the very slow release of cations and silicic acid. All the rate constants for all the feldspars were evaluated at the pH of about 5.

AD-A029 303/5GA PC$3.50/MF$3.00
TRW Systems Redondo Beach Calif
On Diffusion Flames in Turbulent Shear Flows - the Two-Step Symmetrical Chain Reaction,
Francis E. Fendell, and William B. Bush. 1975, 16p ARO-11674.1-E
Contract DAHC04-74-C-0023
Prepared in cooperation with California Univ., San Diego, La Jolla. Dept. of Applied Mechanics and Engineering Sciences.
Availability: Pub. in Combustion Science and Technology, v11 p35-48 1975.

Descriptors: *Flames, *Turbulent diffusion, Shear properties, Reaction kinetics, Mixing, Boundaries, Reprints.
Identifiers: Diffusion flames, Unsteady combustion, Chain reactions.

Often in combustion engineering, when unpremixed gaseous reactants are burned in a low-speed shear flow, product formation is controlled by the rate of mixing, rather than by the rate of reaction. The reaction mechanism is usually modeled as a direct on-step irreversible reaction, with Lewis-Semenov number taken as unity. For laminar flow, Burke and Schumann suggested how knowledge of a passive scalar in the same flow field as the reactants, satsifying similar boundary conditions, and possessing identical diffusion coefficients, furnishes the diffusion-flame solution. Analogously, for the turbulent case, under almost identical constraints, Toor indicated how knowledge of the mean field and probability density function for a passive scalar in an inert flow yields that mean-field behavior of the turbulent diffusion flame in the same flow. The only additional condition is that, in general, the heat associated with chemical reaction must not alter the dynamics. Here, Toor's method is extended to the two-step symmetrical chain reaction of interest in chemical lasers. The highly nonGaussian probability density function implied by Large-scale turbulent structure observed in, at least, portions of the two-dimensional mixing layer downstream of a splitter plate is developed further. (Author)

AD-A029 350/6GA PC$3.50/MF$3.00
Chicago Univ Ill James Franck Inst
High-Temperature Calorimetry of Refractory Ionic and Metallic Systems.
Final rept. 27 Jul 73-26 Jul 76,
O. J. Kleppa. 26 Aug 76, 7p ARO-11483.11-ONC
Grant DAHC04-74-G-0009

Descriptors: Scientific research, Thermodynamics, *Calorimetry, *Refractory materials, Oxides, Alloys, Hydrides, Thermochemistry, Solids, Gases, High temperature.

A brief summary is presented of research supported by this grant. Reference is made to 5 publications in the area of the thermochemistry of ionic solids and to 6 publications on solid-gas calorimetry. (Author)

AD-A029 369/6GA PC$3.50/MF$3.00
Harry Diamond Labs Adelphi Md
Selective Analysis for Carbon Monoxide, Hydrocarbons, and Nitric Oxide in a Stream of Internal Combustion Engine Exhaust Gases: A Literature Survey.
Technical memo.,
Peter C. Sheffer, and J. Michael Boyd. Aug 76, 25p Rept no. HDL-TM-76-15

Descriptors: Internal combustion engines, Literature surveys, Oxidation, Nitrogen oxides, Diesel engines, Carbon monoxide, Hydrocarbons, Automobile exhaust, *Exhaust gases.
Identifiers: *Exhaust analyzers, *Gas detectors.

This paper reports a literature survey on the methods of selective analysis for the exhaust gases including carbon monoxide, hydrocarbons, and nitric oxide. Particular interest is paid to those methods that have the potential to be adapted to the design of a processor for the analyzer.

AD-A029 404/1GA PC$5.00/MF$3.00
Hunter Coll., New York. Dept. of Chemistry
Interaction of Small Molecules with Liquid Crystals; A Spectroscopic Study.
Final rept.,
Bernard J. Bulkin. 16 Aug 76, 96p ARO-8646.10-C
Grants DA-ARO-D-31-124-70-G22, DA-ARO-D-31-124-73-G97

Descriptors: *Liquid crystals, Molecules, *Gas detectors, Vapors, Detection, Infrared spectra, Raman spectra, Gas chromatography.

Infrared and Raman spectroscopy have been used to investigate the interaction of a variety of small molecules with liquid crystals. The systems studied include cholesteric, nematic, and smectic liquid crystals of both the thermotropic and lyotropic types. These results lead to an understanding of structure of liquid crystals and how this structure is perturbed by solutes. They also indicate that solutes may be used to aid in measuring order in liquid crystals. A useful application of these studies, a liquid crystal based fractionator for the detection and identification of a wide variety of molecules in the vapor phase, is presented. This device can be used as a gas chromatograph detector or, more suitably, as a detector/fractionator in a gas chromatograph-infrared spectrometer effluent on-the-fly analyzer. Here the cholesteric liquid crystal color change is used as the detector, and the infrared spectrum provides positive identification. This system can also be used to detect and identify minor components in an air stream. (Author)

AD-A029 458/7GA PC$4.00/MF$3.00
Stanford Research Inst Menlo Park Calif
Determination of the Binding Energy of Excited Rare Gas Dimers.
Final rept. 1 Jun 74-30 Jun 76,
Keith T. Gillen. 23 Aug 76, 40p Rept no. SRI-MP-76-79
Contract N00014-74-C-0307

Descriptors: *Rare gases, *Dimers, Elastic scattering, Metastable state, Atomic energy levels, Argon, Numerical analysis, Neon, Xenon, Potential energy, Emission spectroscopy, Ex-

citation, Molecular energy levels, Numerical analysis, Molecular association.
Identifiers: *Binding energy, Van der Waal forces.

Elastic scattering angular distributions have been measured for scattering of beams of metastable Ar(*), Ne(*), and Xe(*) by their respective ground state atoms at collision energies in the eV range. For neon and argon, calculations have been performed to obtain improved estimates of the relevant interatomic potentials. For the lowest Ar2(*) excimer potential, 1(u), 0(u) - (3 Sigma u), the best available molecular beam and spectroscopic emission data are consistent with the following parameters in Morse-shape potential: D(e) = 0.78 plus or minus 0.04 eV; R(e) = 2.33 plus or minus 0.02 A; omega(e) = 322 plus or minus 20/cm.

AD-A029 472/8GA PC$3.50/MF$3.00
National Bureau of Standards Washington D C
Adsorption and Condensation of Small Molecules on Tungsten(100) as Studied Using X-ray Photoelectron Spectroscopy.
Technical rept.,
John T. Yates, Jr., Theodore E. Madey, Nils E. Erickson, and S. D. Worley. 24 Nov 75, 7p
Contract NAonr-18-76
Availability: Pub. in Chemical Physics Letters, v39 n1 p113-117, 1 Apr 76.

Descriptors: *Chemisorption, *Tungsten, *X Ray photoelectron spectroscopy, Formaldehyde, Carbon dioxide, Carbon monoxide, Oxygen, Condensation, Adsorption, Molecules, Reprints.
Identifiers: *Surface chemistry.

X-ray photoelectron spectroscopy (XPS) has been used to examine the adsorption of H2CO, O2, CO and CO2 on the W(100) surface at 100 K and 300 K. Correlations between XPS measurements and kinetic measurements have been made. (Author)

AD-A029 480/1GA PC$3.50/MF$3.00
Pittsburgh Univ Pa Dept of Physics
Translational Spectroscopy of Metastable Fragments Produced by Dissociative Excitation of Atmospheric Gases by Electron Impact. I. Nitrogen,
W. C. Wells, W. L. Borst, and E. C. Zipf. 2 Sep 75, 13p
Grants DA-31-124-ARO(D)-440, NGL-39-011-030
Availability: Pub. in Physical Review A, v14 n2 p695-706 Aug 76.

Descriptors: *Dissociation, *Atmospheric chemistry, *Atomic spectroscopy, Nitrogen, Excitation, Ionization, Reprints.
Identifiers: Translational spectroscopy, Time of flight spectroscopy, Electron electron interactions.

Kinetic-energy spectra of long-lived high-Rydberg nitrogen atoms produced by electron impact dissociative excitation were measured using a time-of-flight apparatus. Four principal features were found in the fragment kinetic-energy spectra with peaks at 0.6, 2.4, 3.4, and 6.7 eV. The excitation function exhibited a sharp resonance-like behavior near a threshold of 24.1 eV, corresponding to fragment production of N(quadruplet S)+N**, where N** is a high-Rydberg atom with an energy near the ionization limit of N(14.54 eV). The observed features are discussed in terms of the core-ion model of high-Rydberg dissociation. The data are compared with other dissociative excitation and dissociative ionization work. Geophysical implications of these measurements concerning heating of the atmosphere, radiative transfer of resonance radiation, and chemical reactions are mentioned briefly.

AD-A029 498/3GA PC$3.50/MF$3.00
Joint Inst for Lab Astrophysics Boulder Colo
Teratomic Recombination in Alkali Metal-Noble Gas Vapors,
Richard Scheps, and Alan Gallagher. 22 Dec 75, 13p
Availability: Pub. in the Jnl. of Chemical Physics, v65 n3 p859-871, 1 Aug 76.

Descriptors: *Recombination reactions, *Alkali metals, *Rare gases, Reaction kinetics, Xenon, Excitation, Krypton, Argon, Sodium, Lithium, Rubidium, Vapors, Fluorescence, Reprints.

The teratomic recombination rates for the reaction M* + 2X yields MX* + X have been studied for Rb-Xe, Na-Ar, Kr, Xe, and Li-Ar, Kr, Xe. This analysis employs data and moelcular potential determinations from earlier measurements where free alkali M was optically exicted to M* in the presence of noble gas X and the MX* yields MX fluorecence resulting from teratomic recombination was measured. Collisional processes compete with radiative decay, so that in the low (X) limit where dissociation collisions are negligible the ratio of bound molecular to atomic photon emission gives the branching ratio between the molecular formation rate and the known atomic radiative rate. The molecular spectrum is observed as a continuum whose intensity profile may be used to infer a bound state vibrational distribution at each (X). Both bound and quasibound states are included in this distribution, as both contribute to the observed molecular spectra. The low pressure limit of this distribution yields the teratomic recombination rate as a function of binding energy, and the total recombination rate constant kf. It is generally found that this distribution per quantum state is almost independent of binding energy; i.e., the probability of molecular formation appears to be about the same for all bound states, it does not favor the highest bound levels. When the density of states is considered, weakly bound molecules are formed more frequently, but this weighting depends on the shape of the potential rather than the gas temperature. Comparison with theoretical models is made, and reasons for the discrepancies are discussed. (Author)

AD-A029 501/4GA PC$3.50/MF$3.00
Columbia Radiation Lab New York
Probing Adiabatic States,
A. Flusberg, and S. R. Hartmann. 28 Jan 76, 3p
Contract DAAB07-74-C-0341, Grant NSF-DMR-73-07600
Availability: Pub. in Physical Review A, v14 n2 p813-815 Aug 76.

Descriptors: *Atomic spectroscopy, Adiabatic conditions, Light pulses, Excitation, Dispersion relations, Transients, Reprints.
Identifiers: Excited states, Atomic energy levels.

The problem of monitoring an excited state by a probe beam resonant with the transition to a second excited state is examined in the case in which the first excited state is adiabatically excited off resonance. It is shown that dispersive effects are to be expected, and their magnitude is estimated. (Author)

AD-A029 527/9GA PC$3.50/MF$3.00
Aerospace Corp El Segundo Calif Aerophysics Lab
The Role of Electron Spin in the NF Kinetic System.
Interim rept.,
John M. Herbelin. 30 Jul 76, 13p TR-0076(6240-40)-8, SAMSO-TR-76-155
Contract F04701-75-C-0076

Descriptors: *Molecular spectroscopy, Reaction kinetics, *Diatomic molecules, Spinning(Motion), Ground state, Methyl radicals, Hydrogen, Deuterium.
Identifiers: Electron spin, Wigner-Witmer rules, *Nitrogen fluorides.

The reactions for the production and removal of the three lowest electronic states of nitrogen fluoride, NF(X triplet sigma), NF(a singlet delta), and NF(b singlet sigma +), are discussed from the standpoint of electron spin conservation. By invoking the Wigner-Witmer spin rule together with other spin-related properties, it is indicated that the electronically excited NF(a singlet delta) not only is the preferred product from the reaction of H, (D), and CH3 with NF2, but should also be less reactive toward other atoms, radicals, and itself than its ground-state counterpart NF(X triplet sigma). These conclusions are shown to be consistent with existing experimental results. (Author)

AD-A029 634/3GA PC$4.00/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
Values for Selected Collisional Dissociation Rate Coefficients of Positive Clustered Ions.
Final rept.,
J. M. Heimerl. Aug 76, 34p Rept no. BRL-1917
Supersedes Rept. no. BRL-IMR-499.

Descriptors: *Dissociation, *Cations, *Collisions, *Aeronomy, Reaction kinetics, Temperature, Air, Oxides, Hydrogen compounds, Nitrogen compounds, Carbon compounds.

Values of the rate coefficient, kr, for 15 gas-phase, two-body, collisional-dissociation reactions involving positive cluster ion of aeronomic interest have been tabulated. These values have been cast into the form kr = A (T/300) to the Bth power exp (C/T). Where possible, error bounds for the constants A, B and C have been examined. (Author)

AD-A029 649/1GA PC$3.50/MF$3.00
Army Medical Intelligence and Information Agency Washington D C
The Solubility of Several Aromatic Hydrocarbons in Water,
A. N. Guseva, and Ye. I. Parnov. 19 Aug 76, 5p
Rept no. USAMIIA-K-6467
Trans. of report from Vestnuk Mosk. Univ. Ser. II Khim (USSR) v18 n1 p76-78 1963.

Descriptors: *Hydrocarbons, *Solubility, *Water, *Aromatic compounds, *Benzene, *Benzene compounds, Xylenes, Toluenes, Methyl radicals, High temperature, USSR, Translations, Reviews, Molecular structure, Temperature, Graphs.

In order to solve a number of theoretical problems in petroleum geology, for example, the formation and disintegration of agglomerates, as well as certain practical problems in the area of petroleum refining, water pollution, etc., information is needed regarding the solubility of hydrocarbons in various types of natural solutions under various conditions. Existing literature data on the solubility of hydrocarbons, even in pure water, are quite meager. There is especially little material on the solubility of hydrocarbons in water at the high temperatures which can occur at great depths. In the study reported here benzene, toluene, o-xylene, m-xylene, n-xylene and mesitylene were used; the criterion of purity was the index of refraction. Especially pure water was obtained by passing a double distillate through a filter with a 'mixed' layer consisting of ion-exchange resins EDE-10P and KU-2. The solubilities of the aromatic hydrocarbons in water was determined in sealed ampules by the polythermic method. As is evident from graphs, the solubility curves have an extremely similar character, with the exception of benzene whose curve shape is slightly different from the other hydrocarbons. The solubility of hydrocarbons increases intensely with temperature and decreases as the number of methyl groups in the molecule is increased. As the critical point is approached the curves of different hydrocar-

bons show a tendency to converge, as with increase of temperature the solubility depends all the more on the structural properties of the water. Also the role of the structure of hydrocarbon molecules, including the number and location of methyl groups, is increasingly weaker.

AD-A029 653/3GA PC$4.00/MF$3.00
Indiana Univ Bloomington Dept of Chemistry
A Selective Spectral-Line Modulation Technique for High Sensitivity Continuum Source Atomic Absorption Spectrometry.
Interim technical rept.,
Ronald L. Cochran, and Gary M. Hieftje. 25 Aug 76, 44p Rept no. TR-1
Contract N00014-76-C-0838, Grant NSF-CHE-76-10696

Descriptors: *Atomic spectroscopy, *Spectral lines, *Modulation, Sensitivity, Broadband, Flames, Background, Monochromators, Continuum mechanics, Interference.
Identifiers: *Atomic absorption, Multielement analysis, Spectrochemical analysis.

A selective spectral-line modulation technique for performing continuum-source atomic absorption is described and its operation discussed. In the new technique, discrete droplets of a metal salt standard solution are periodically introduced into a source modulator flame. The atom clouds produced within this flame move through the radiation path of a continuum source, thereby selectively modulating only those atomic lines characteristic of the atoms within the cloud. This combination of continuum source and source modulator flame replaces a modulated line source within an otherwise typical atomic absorption spectrometer. The system is shown to enable multielement analysis and exhibits relative freedom from both line and broad-band spectral interferences. Analytical curves and sensitivities obtained with the system for several elements are presented. Extensions of the system and its applications are briefly discussed. (Author)

AD-A029 654/1GA PC$3.50/MF$3.00
Indiana Univ Bloomington Dept of Chemistry
An Automatic Background-Correcting Spectrometer.
Interim technical rept.,
Robert J. Sydor, James T. Sinnamon, and Gary M. Hieftje. 25 Aug 75, 21p Rept no. TR-2
Contract N00014-76-C-0838, Grant PHS-GM-17905-04

Descriptors: *Atomic spectroscopy, *Modulation, Photodetectors, Photomultiplier tubes, Flames, Automatic, Channels, Background, Interference.
Identifiers: Atomic absorption.

A new type of automatic, dual-channel, background correcting spectrometer has been developed. In the new spectrometer, one channel monitors the analyte line while the other views the background. The slit for the background channel, centered on the analyte, has a 1 mm width and is bisected by a thin wire which blocks out the radiation from the analyte line. Consequently, the background-channel photomultiplier tube receives radiation from both sides of the analyte line but not from the line itself. The signals from the two photomultiplier tubes are subtracted, the difference being the background-corrected value. Several determinations were performed showing the systems potential-calcium in a much higher concentration of potassium calcium in blood serum and barium in calcium solutions. These results were compared to those obtained by scanning across the analyte line and manually subtracting the background value. The two methods yielded very similar results. (Author)

AD-A029 663/2GA PC$3.50/MF$3.00
Toronto Univ (Ontario) Inst for Aerospace Studies
Equilibrium Composition Data for Combustible Stoichiometric Mixtures of Hydrogen-Oxygen (Water).
Technical note,
Randy A. Roig. Apr 76, 15p UTIAS-TN-201, AFOSR-TR-76-0949
Grant AF-AFOSR-2274-72

Descriptors: *Hydrogen, *Oxygen, *Water, *Combustion, *Chemical equilibrium, *Implosions, Stoichiometry, Mixtures, Temperature, Pressure, Thermodynamics, Spectroscopy, Canada.

Equilibrium properties of combustible stoichiometric mixtures of hydrogen-oxygen (water) have been computed for a range of pressures and temperatures consistent with a gas-driven implosion. Dissociation, ionization, and lowering of the ionization potential have been taken into account for computation of the chemical equilibrium conditions. The program is based on the shock equilibrium program of Horton and Menard (1969). To this program were added corrections due to van der Waal's forces and lowering of the ionization potential. The latter effect was especially important at high electron number densities. The results should provide insight into spectroscopic data obtained from gas-driven implosions. (Author)

AD-A029 675/6GA PC$3.50/MF$3.00
Utah Univ Salt Lake City Dept of Chemistry
Ultrasonic Absorption Kinetic Studies of the Complexation of Aqueous Li+, Na+, Rb+, Tl+, Ag+, NH(4)+, and Ca(super 2)+ by 18-Crown-6.
Technical rept.,
Gerard W. Liesegang, Michael M. Farrow, F. Arce Vazquez, Neil Purdie, and Edward M. Eyring. 1 Sep 76, 22p Rept no. TR-8
Contract N00014-75-C-0796

Descriptors: *Complex compounds, *Reaction kinetics, Sodium, Silver, Ammonia, Ultrasonic frequencies, Ions, Ligands, Numerical analysis, Decomposition, Calcium, Thallium, Lithium, Rubidium, Oxygen heterocyclic compounds, Biochemistry.
Identifiers: *Hexaoxacyclooctadecanes.

The complexation-decomplexation reaction kinetics of the macrocyclic polyether 18-crown-6 (1,4,7,10,13,16-hexaoxacyclooctadecane) with the aqueous cations Li(+), Na(+), Rb(+), Tl(+), Ag(+), NH4(+) and Ca(2+) have been determined from acousto-optic ultrasonic absorption data covering the 15-205 MHz frequency range, at 25C. These data, together with a previously reported crown ether conformational change, were analyzed in terms of a multistep mechanism that admits the possibility of water loss or conformational changes but not diffusion as being rate limiting. The complexation rate constants follow the trend Ca(2+) then Li(+) < Na(+) < K(+) then Cs(+) then Rb(+) < NH4(+) < Tl(+) < Ag(+).

NTIS/PS-76/0687/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 3. Graphite-Physical, Mechanical and Structural Studies (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Mona F. Smith. Sep 76, 215p*
Supersedes NTIS/PS-75/615, and NTIS/PS-75/181.

Descriptors: *Bibliographies, *Carbon, *Graphite, Synthesis(Chemistry), Oxidation, Coatings, Mechanical properties, Nuclear reactor materials, Radiation effects, Chemical reactions, Surface properties, Pyrolitic graphite, Radiation effects, Abstracts.
Identifiers: NTISNTIS.

Research on the physical, mechanical, and structural properties of graphite are presented. Studies of graphite composites and fibers are excluded along with graphite chemistry. The majority of these studies deal with the use of graphite as a reactor material. (This updated bibliography contains 210 abstracts, 68 of which are new entries to the previous edition.)

NTIS/PS-76/0688/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 4. Graphite-Chemical Properties (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Mona F. Smith. Sep 76, 150p*
Supersedes NTIS/PS-75/616.

Descriptors: *Bibliographies, *Graphite, Surface properties, Chemical reactions, Thermodynamics, Oxidation, Mechanical properties, Preparation, Pyrolytic graphite, Chemisorption, Nuclear reactor materials, Abstracts.
Identifiers: Intercalation compounds.

The research citations cover the chemistry of graphite. Included are studies on vaporization, thermodynamics, surface chemistry, intercalation compounds, chemisorption, and oxidation. (This updated bibliography contains 145 abstracts, 20 of which are new entries to the previous edition.)

NTIS/PS-76/0689/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 5. Carbon Research (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Mona F. Smith. Sep 76, 109p*
Supersedes NTIS/PS-75/617, and NTIS/PS-75/182.

Descriptors: *Bibliographies, *Carbon, Activated carbon, Coke, Metallurgical fuels, Structural analysis, Chemical reactions, Absorbers(Materials), Porous materials, Carbon black, Abstracts.

The cited studies cover the use, physical and mechanical properties, production and chemistry of various forms of carbon such as carbon black, carbon foams, chars, coke, and activated carbon. Graphite and glassy carbon research are covered in separate bibliographies as are studies on carbon and graphite fibers and their composites. (This updated bibliography contains 104 abstracts, 24 of which are new entries to the previous edition.)

PB-256 282/5GA PC$5.50/MF$3.00
Virginia Polytechnic Inst. and State Univ., Blacksburg. Div. of Minerals Engineering.
Iterative and Finite Difference Computer Programs for Diffusion in Single and Two Phase Systems.
Final rept.,
J. Unnam, and C. R. Houska. Jan 76, 105p NSF-GH-30180A-1
Grant NSF-GH-30180

Descriptors: *Diffusion theory, *Finite difference theory, *Computer programs, Atomic theory, Boltzmann equation, Mathematical models, Partial differential equations, Computation, FORTRAN.

Four computer programs are included in this report which describe atomic diffusion in finite, single and two-phase systems. They are restricted to planar, one-dimensional systems. However, the diffusion coefficient may vary

continuously with composition and need not be fitted to special functions. Consequently, smoothed experimental coefficients can be used as input. Two of the programs are iterative solutions based upon modified Boltzmann integral functions. Both require two to three magnitudes less computer time than the corresponding finite-difference calculations and are readily used to determine diffusion coefficients by a trial and error fitting of the composition profile. Two finite difference programs are also included which treat the same problem conditions.

PB-256 586/9GA PC$5.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The First Spectrum of Hafnium (Hf I).
Final rept.,
William F. Meggers, and Charlotte E. Moore. Jul 76, 121p NBS-Mono-153
Library of Congress catalog card no. 76-872.

Descriptors: *Hafnium, *Atomic spectra, Tables(Data), Line spectra, Zeeman effect, Ultraviolet spectra, Visible spectra, Ionization potentials.
Identifiers: Spectrochemical analysis.

The present publication terminates the work on the analysis of Hf I which was started by the late W. F. Meggers in 1928 and left unfinished in 1966. His final line list contains some 4700 lines of which about 67 percent have been classified. Observed g-values are known for 198 levels. The reliability of the Zeeman observations is indicated in tables containing sums of Observed and Lande g-values for selected groups of 'even' and 'odd' terms. An attempt has been made to continue Meggers' analysis in LS-coupling as far as possible. This coupling is not rigorous in Hf I, and many intervals are irregular. Consequently, the levels are given also in numerical order with the even and odd levels presented in separate tables. An ionization limit of 54700 plus or minus 600/cm, giving an ionization potential of 6.78 plus or minus 0.07 eV has been derived from a two-member series. The long line lists are given in two Appendices: Appendix A contains the observed Zeeman data for the individual lines, 531 in all; Appendix B consists of the complete line list of observed and classified lines. By far the greater part of the analysis is that Meggers. Detailed notes explain changes that have been introduced and additions to this work.

PB-256 600/8GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
The Electron Factor in Catalysis on Metals Electrocatalysis on Non-Metallic Surfaces.
Final summary rept.,
L. H. Bennett, and A. D. Franklin. May 76, 72p NBSIR-75-1049
Sponsored in part by National Science Foundation, Washington, D.C. Div. of Materials Research, and Energy Research and Development Administration, Washington, D.C. Div. of Conservation Research and Technology.

Descriptors: *Catalysis, *Metals, *Surface chemistry, *Electrons, *Nonmetallic coatings, *Fuel cells, *Meetings, Electrolytes, Electrochemistry, Chemisorption, Abstracts, Electrodes, Ions, Supports, Atomic energy levels.

Two related workshops were held at the NBS in Gaithersburg, Md. on Dec. 9-12, 1975, on topics of importance for energy conversion. These topics, concerned with some of the science underlying the development of fuel cells for electric utility use, are: (1) The Electron Factor in Catalysis on Metals; and (2) Electrocatalysis on Non-Metallic Surfaces. This report includes discussions of the needs and expected benefits, lists of attendees, descriptions of the programs, and summaries of the major problems, advances and opportunities revealed by the two workshops.

PB-256 863/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Adsorption and Condensation of Small Molecules on Tungsten(100) as Studied Using X-Ray Photoelectron Spectroscopy.
Final rept.,
John T. Yates, Jr., Theodore E. Madey, Nils E. Erickson, and S. D. Worley. 24 Nov 75, 7p
Prepared in cooperation with Auburn Univ., Ala. Dept. of Chemistry. Pub. in Chemical Physics Letters, v39 n1 p113-117, 1 Apr 76.

Descriptors: *Surface chemistry, *Tungsten, *Formaldehyde, *Oxygen, *Carbon monoxide, *Carbon dioxide, Photoelectron spectroscopy, Chemisorption, Kinetic energy.
Identifiers: Reprints, X ray photoelectron spectroscopy.

X-ray photoelectron spectroscopy (XPS) has been used to examine the adsorption of H2CO, O2, and CO2 on the W(100) surface at 100 K and 300 K. Correlations between XPS measurements and kinetic measurements have been made.

PB-256 869/9GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C.
Saturated Absorption Line Shape: Calculation of the Transit-Time Broadening by a Perturbation Approach.
Final rept.,
C. J. Borde, J. L. Hall, C. V. Kunasz, and D. G. Hummer. 24 Nov 75, 30p
Grant NSF-GP-39308
Prepared in cooperation with Joint Inst. for Lab. Astrophysics, Boulder, Colo. Pub. in Physical Review A, v14 n1 p236-263 Jul 76.

Descriptors: *Molecular energy levels, Perturbation theory, Fourier transformation, Laser beams, Doppler effect, Molecular relaxation, Line spectrum.
Identifiers: Reprints, *Laser spectroscopy.

The authors present a third-order perturbation calculation of line shapes in laser spectroscopy based on the density-matrix formalism. The new feature of this theory is the inclusion of the Gaussian spatial structure of the laser beams. They study the line width as a function of relaxation and transit times. A shift is found when the wave fronts are not flat. General line-shape formulas are given as well as approximate formulas valid in various domains.

PB-256 917/6GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Molecular Dynamical Studies of Energy Transport in a Crystalline Solid.
Final rept.,
D. H. Tsai, and R. A. MacDonald. Apr 76, 22p
Contract AT(49-13)-3003
Proceedings of Symposium on Computer Simulation for Materials Applications Held at Gaithersburg, Md. on Apr 19-21, 1976. Pub. in Nuclear Metallurgy, v20 p489-509 Apr 76.

Descriptors: *Crystal lattices, Computerized simulation, Mathematical models, Transport properties, Thermal diffusivity, Shock waves, Heat transfer, Iron.
Identifiers: *Molecular dynamics, Second sound.

The authors reviewed the main results of a series of molecular dynamical studies of the transport of energy in a crystalline solid subjected to heating and to shock compression. The model is a perfect semi-infinite bcc lattice. They used a two-body interatomic potential which simulates that in alpha-iron. The classical equations of motion for the atoms are solved numerically under appropriate initial and boundary conditions, and the properties of the lattice and the transport of energy are determined from averages of the atomic motion. It was found that a disturbance in thermal energy propagates either by diffusion or as a temperature wave with second sound velocity. A disturbance in potential energy propagates as a stress wave with first sound velocity. These results are in agreement with experiments. In addition, it was found that longitudinal and transverse stress waves generate their own temperature waves through thermalization of the kinetic energy change accompanying the stress disturbances. The significance of this thermal relaxation process to the interpretation of heat pulse and shock wave experiments is examined.

PB-256 919/2GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Methyl Group Rotation and the Low Temperature Transition in Hexamethylbenzene. A Neutron Diffraction Study.
Final rept.,
Walter C. Hamilton, James W. Edmonds, Armin Tippe, and J. J. Rush. 11 Jun 69, 15p
Prepared in cooperation with Brookhaven National Lab., Upton, N.Y. Pub. in Discussions of the Faraday Society, n48 p192-204 1969.

Descriptors: *Neutron diffraction, *Rotational spectra, Benzene, Crystal structure, Aromatic hydrocarbons, Inelastic scattering, Infrared spectra.
Identifiers: Reprints, *Benzene/hexamethyl.

Neutron diffraction studies of single crystals of hexamethylbenzene at 298 K and at 130 K indicate that the molecule in phase II has approximate D3d symmetry. The amplitudes of libration of the methyl group and of rigid body motions of the molecule are consistent with earlier data, except that the barrier to methyl group rotation appears to be lower by about 0.5 kcal/mol (2100 J/mol). Consideration of intra- and intermolecular hydrogen atom contact distances and calculated potential energy curves using a 6-exp potential function suggest that intermolecular forces are important in determining the barrier to rotation of the methyl groups and that substantial changes in the intermolecular packing must be responsible for the lambda-point transition at 116 K and the consequent profound change in the potential barrier to internal rotation which has been previously observed.

PB-256 983/8GA PC$5.50/MF$3.00
Avco Everett Research Lab., Inc., Everett, Mass.
Study of the Interaction of Plasma Proteins with Prosthetic Surfaces. III.
Annual rept. 1 Dec 74-30 Nov 75,
E. Nyilas, T-H. Chiu, D. M. Lederman, and B. B. Adams. May 76, 105p NIH-N01-HB-3-2917-3
Contract N01-HB-3-2917
See also PB-242 650.

Descriptors: *Blood proteins, *Surface chemistry, *Prosthetic devices, Blood plasma, Adsorption, Materials, Surface properties, Thermodynamics, Electrophoresis, Heat measurements, Isotherms, Fibrinogens, Globulins.
Identifiers: *Biomaterials, *Blood compatible materials.

Studies on the human native plasma protein/prosthetic surface interactions were continued using solution adsorption, microcalorimetric and electrophoretic mobility techniques. The 25C integral net heats of sorption of purified fibrinogen (FGN, clottability > 92%) on glass powder (GP, 9.85 sq m/g), measured in a standardized buffer partially simulating plasma, were disproportionately greater

than those reported earlier for gamma-(7S)-globulin (gammaIGLB). Microcalorimetric and corresponding electrophoretic data indicate a substantial degree of conformational distortion of both proteins on GP. LTI-carbon, a relevant biomaterial, was converted into a microparticulate adsorbent having an inherent porosity. Its effective surface area for macromolecular adsorption was determined by mercury infusion. The 25C integral net heats of both gamma-GLB and FGN on LTI-carbon were generally smaller, by a factor of 5, than those on GP. Data obtained by all 3 methods consistently indicate substantially smaller conformational changes for both proteins on LTI-carbon.

7E. Radio and Radiation Chemistry

PB-257 025/7GA PC$16.25/MF$3.00
Notre Dame Univ., Ind. Radiation Chemistry Data Center.
BIWeekly List of Papers on Radiation Chemistry. Volume 8. Annual Cumulation with Keyword and Author Indexes,
A. B. Ross, and A. K. E. Hagopian. Aug 76, 672p
See also COM-75-11475. Prepared in cooperation with National Bureau of Standards, Washington, D.C., and Environmental Research and Development Administration, Washington, D.C.

Descriptors: *Radiation chemistry, *Indexes(Documentation), Polymers, Luminescence, Radiobiology, Electron paramagnetic resonance, Authors.
Identifiers: Photochemistry, Hot atom chemistry, Pulse radiolysis.

This document is the annual edited cumulative list of references to the published literature on radiation chemistry and related fields. References are drawn from 55 journals published throughout the world. The list is generated from the Biweekly List of Papers on Radiation Chemistry and contains the literature references and an author and subject index. The publication represents one of the continuing data activities of the Radiation Chemistry Data Center (RCDC) at the University of Notre Dame.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

E76-10437 PC$4.00/MF$3.00
National Marine Fisheries Service, Bay Saint Louis, Miss. Fisheries Engineering Lab.
LANDSAT Follow-On Experiment: Gulf of Mexico Menhaden and Thread Herring Resources Investigation.
Progress rept. no. 3, 31 Oct 75-31 Jan 76,
Kenneth Savastano, Andrew J. Kemmerer, and Kenneth Faller. Feb 76, 37p SEFC-Contrib-442, MARMAP-Contrib-111, NASA-CR-148545
NASA Order S-54114
Marine Resources Monitoring Assessment and Prediction. Prepared in cooperation with National Space Technology Labs., Bay St. Louis, Miss.

Descriptors: Mississippi, Color, Fishes, Coasts, Louisiana, Oceanography, *Marine resources, *Gulf of Mexico, Earth resources program, Multispectral band scanners, Mapping.
Identifiers: *Fishing grounds, Oceanographic surveys.

The author has identified the following significant results. The most significant achievement realized is the successful mapping of high probability fishing areas from Landsat MSS data for two Mississippi Sound missions.

E76-10454 PC$4.00/MF$3.00
National Marine Fisheries Service, Bay Saint Louis, Miss. Fisheries Engineering Lab.
LANDSAT Follow-On Experiment: Gulf of Mexico Menhaden and Thread Herring Resources Investigation.
Progress rept. no. 5, 1 May-31 Jul 76,
Kenneth Savastano, Andrew J. Kemmerer, Thomas Leming, Hillman Holley, and Kenneth Faller. Aug 76, 50p SEFC-Contrib-456, NASA-CR-148585
NASA Order S-54114

Descriptors: *Fishes, Coasts, Oceanography, Gulf of Mexico, Earth Resources Program, Multispectral band scanners, Algorithms.
Identifiers: *Mexico Gulf.

The author has identified the following significant results. The most significant achievements realized thus far include the successful charting of high probability fishing areas from Landsat MSS data and the successful simulation of an operational satellite system to provide tactical information for the commercial harvest of menhaden.

PB-255 732/0GA PC$3.50/MF$3.00
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
The Replication of Biological Events in Enclosed Water Columns,
P. Koeller, T. R. Parsons, M. Takahashi, W. H. Thomas, and D. L. R. Seibert. Sep 75, 21p
NSF/IDOE-76-26
Grants NSF-GX-39148, NSF-GX-39145
Prepared in cooperation with British Columbia Univ., Vancouver. Inst. of Oceanography. Pub. in Arch. Hydrobiol. v76 n1 p5-23 Sep 75.

Descriptors: *Marine biology, *Plankton, Turbulence, Food chains, Containers, Undersea habit atmospheres, Advection, Growth, Plankton blooms, Abundance, Primary biological productivity, Tables(Data).
Identifiers: Reprints, International Decade of Ocean Exploration, Ecosystems.

The biology of four seventy-tons water columns isolated in plastic containers followed a very similar sequence of events during a thirty-day study period. The biology of the captured water columns was also similar to events occurring in the water outside. These results are discussed in the light of current attempts to explain the patchiness of plankton and in the use of large plastic containers as controlled ecosystems in which to study the effects of perturbations.

PB-256 161/1GA Not available NTIS
Florida State Univ., Tallahassee. Dept. of Meteorology.
Spatial Inhomogeneity in the Oceans. Chapter 12,
J. J. O'Brien. 1975, 3p NSF/IDOE-76-79
Sponsored in part by Office of Naval Research, Arlington, Va.
Pub. in Modelling of Marine Systems, p235-236 1975.

Descriptors: *Oceanographic surveys, *Plankton, *Spatial distribution, Ocean environments, Theorems, Marine biology, Phytoplankton, Zooplankton, Mathematical models, Simulation, Time measurement, Dimensional measurement.
Identifiers: International Decade of Ocean Exploration.

This article briefly discusses the need for further research in the area of physical oceanography. The research proposed is concerned with spatial inhomogeneity in the oceans. This study is geared more toward theoretical analysis at present. The horizontal lengthscale relevant to the study is the range of 100 to 10,000 m. The vertical range scales are 0.1 to 100 m and the time scales of interest include 10,000 to 10,000,000 sec., covering the range from the generation time of phytoplankton to the lifetime of the largest zooplankton patch ever studied systematically.

PB-256 807/9GA
Duke Univ., Beaufort, N.C. Marine Lab.
The Detection of Ferric Specific Organic Chelators in Marine Phytoplankton Cultures,
L. J. Spencer, R. T. Barber, and R. A. Palmer. 1972, 15p NSF/IDOE-76-134
Grants NSF-GA-27725, NSF-GA-28333
Prepared in cooperation with Duke Univ., Durham, N.C. Dept. of Chemistry.
Pub. in Marine Technology Society 'Food - Drugs from the Sea', Proceedings, p203-216 1972.

Descriptors: *Phytoplankton, *Plankton, *Hydroxamic acids, Cultures(Biology), Chelating agents, Metabolism, Biosynthesis, Biochemistry, Marine biology, Ecology, Biological productivity, Upwelling.
Identifiers: Autotrophic growth.

Based on the functional similarity of the chelators proposed to be present in marine systems and the naturally occurring hydroxamic acids discovered by J. B. Neilands in 1952, the authors hypothesize that these organic chelators are hydroxamic acids. Evidence which supports this hypothesis is reported. By culturing phytoplankton in iron deficient media and extracting these media during the exponential growth phase, extracts have been obtained which exhibit visible spectral absorptions characteristic of naturally occurring ferric hydroxamates. More than fifty hydroxamic acids have been isolated from terrestrial microbial systems. These compounds, which are believed to function as iron transport agents, have been found to exhibit diverse biological activities dependent on their individual structure.

PB-256 904/4GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Herbivory as a Factor in Patterns of Nutrient Utilization in the Sea,
John J. Walsh. 29 Jan 75, 13p NSF/IDOE-76-140
Grant NSF-IDO72-06422
Pub. in Limnology and Oceanography, v21 n1 p1-13 Jan 76.

Descriptors: *Nutrients, *Ecology, *Marine biology, Upwelling, Divergence, Ocean currents, Gradients, Primary biological productivity, Correlation techniques, Distribution(Property), Variations, Ocean environments, Nitrogen.
Identifiers: Reprints, International Decade of Ocean Exploration, Habitats, Ecosystems.

A comparison of the horizontal nutrient gradients in coastal upwelling systems of the eastern boundary currents, in offshore divergences of high and low latitudes, and in the central gyres of the oceans suggests that changes in the dominant frequencies of variability of the physical habitat may define the importance of grazing stress as a constraint to nutrient utilization in the sea.

PB-256 906/9GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Inorganic Nitrogen Uptake by Marine Phytoplankton Under in situ and Simulated in situ Incubation Conditions: Results from the Northwest African Upwelling Region,
J. J. MacIsaac, and R. C. Dugdale. 11 Oct 75, 4p
Contrib-809, NSF/IDOE-76-127
Grants NSF-GB-18568, NSF-IDO72-06422
Pub. in Limnology and Oceanography, v21 n1 p149-152 Jan 76.

Descriptors: *Marine biology, *Phytoplankton, *Upwelling, *North Atlantic Ocean, Nitrogen cycle, Inorganic nitrates, Ammonium compounds, Light(Visible radiation), Sea water, Isotopic labeling, Mauritania, Nutrients, Ecology, Coasts, Simulation, Depth, Africa.
Identifiers: Reprints, Northwest Region(Africa), International Decade of Ocean Exploration, Spanish Sahara(Africa).

Ammonium and nitrate uptake by euphotic zone populations of marine phytoplankton were compared under in situ and simulated in situ incubation conditions. The in situ values from all depths were generally higher than those from deck incubators, but the source of the difference was not identified. Copyright (c) 1976 by the American Society of Limnology and Oceanography, Inc.

PB-256 908/5GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Implications of a Systems Approach to Oceanography,
John J. Walsh. 1972, 10p NSF/IDOE-76-125
Grants NSF-GB-8648, NSF-GB-18568
Pub. in Science, v176 p969-975, 2 Jun 72.

Descriptors: *Marine biology, *Upwelling, *Ecology, *Systems engineering, *Data processing, Mathematical models, Oceanographic data, Environmental impacts, Interactions, Shipboard computers, Field tests, Periodic variations, Real time operations, Coasts, Ocean environments, Turbulence, Mathematical prediction.
Identifiers: Reprints, International Decade of Ocean Exploration, Ecosystems.

The systems approach used in the International Biological Program studies of upwelling ecosystems is discussed. Interaction of environmental data, experimental work, data analysis, and simulation models is essential for investigation of total ecosystems. The field and theoretical results of studies on upwelling ecosystems over the last 3 years have demonstrated the necessity for experimental oceanography based on computers capable of rapid data analysis and on simulation modeling both aboard ship and ashore. Requirements for a computing facility aboard ship are particularly stringent, for the system must be capable of acquiring data in real time, of data editing of both underway and batch input, of graphic display of historical data, of presentation of ongoing laboratory experiments aboard ship, and of running simulation models. A real-time awareness of the ecosystem allows the systems oceanographer, while in the field, to plan tactical responses to temporal and spatial variations of upwelling ecosystems.

PB-256 990/3GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Continuous Culture of Marine Diatoms Under Silicate Limitation. I. Synchronized Life Cycle of Skeletonema costatum,
Curtiss O. Davis, Paul J. Harrison, and Richard C. Dugdale. 5 Oct 72, 8p Contrib-709, NSF/IDOE-76-135
Grants NSF-GB-7394, NSF-GA-31093
Sponsored in part by Grant NSF-GB-20182.
Pub. in Jnl. of Phycology, v9 n3 p175-180 1973.

Descriptors: *Diatoms, *Algae, Silicate minerals, Culture media, Cultures(Biology), Growth, Life cycles, Reproduction(Biology), Experimental data, Primary biological productivity.
Identifiers: Skeletonema costatum.

Skeletonema costatum was grown in silicate-limited continuous culture. Culture conditions resulted in synchronization of sexual reproduction. A detailed description of the life cycle is presented. During the life cycle growth rates varied from 0 to 0.12 per hr. Sexual reproduction in diatoms has often been observed in batch cultures and some stages have been reported in nature. However, this is apparently the first report of its occurrence in continuous culture. Other experiments that demonstrate the importance of sexual reproduction in continuous culture work are discussed. S. costatum was chosen for this study as it is a common species in upwelling areas and in temperate, neritic waters of the world oceans.

PB-257 022/4GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.
Objective Analysis of the Upwelling Ecosystem Off Baja California,
Dong-Ping Wang, and John J. Walsh. 19 Feb 75, 18p NSF/IDOE-76-139
Grant NSF-IDO72-06422
Prepared in cooperation with Johns Hopkins Univ., Baltimore, Md. Chesapeake Bay Inst., and Brookhaven National Lab., Upton, N.Y.
Pub. in Jnl. of Marine Research, v34 n1 p43-60 1976.

Descriptors: *Ocean currents, *Nutrients, *Fishing grounds, *Upwelling, Orthogonal functions, Primary biological productivity, Biomass, Inorganic phosphates, Inorganic nitrates, Circulation, Plankton, North Pacific Ocean, Dinoflagellata, Mexico, Coasts.
Identifiers: Reprints, International Decade of Ocean Exploration, Baja California, Ecosystems, Coastal upwelling ecosystems analysis.

The method of empirical orthogonal function (EOF) analysis is applied to nutrient data of hydrostations and surface maps to study the temporal and spatial structures of the major processes in the upwelling ecosystem off Baja California, during the 1972 MESCAL I experiment. It is demonstrated that the EOF analysis leads to a meaningful separation of the uptake process from the dominant conservative processes. In the interior, the upwelling ecosystem was characterized by isentropic flow and the uptake of phosphate and nitrate by the downward migrating dinoflagellates. At the surface, while the general background showed alongshore quasi-steady band structures, there appeared distinct, temporally variable patches of upwelled water. Evidence suggests that the transition from 'new' patches of high nutrient but low fluorescence concentrations to 'old' patches of low nutrient but high fluorescence concentrations is induced mainly by the local decay of upwelling circulation.

PB-257 032/3GA Not available NTIS
National Science Foundation, Washington, D.C. Office for the International Decade of Ocean Exploration.
Biological Modelling I (Chapter 9),
Richard C. Dugdale. 1974, 20p NSF/IDOE-76-132
Pub. in Modelling and Marine Systems, ch 9 p187-205 1974.

Descriptors: *Marine biology, *Biological productivity, *Ecology, Mathematical models, Primary biological productivity, Nutrients, Upwelling, Models, Simulation, Populations, Plankton, Zooplankton, Phytoplankton.
Identifiers: *Biological models, Ecosystem models.

Biological simulation models are taken to mean those attempts to build quantitative descriptions of marine organisms or systems at a level of realism and detail that dictates the use of modern electronic computers. Present modeling efforts are a logical outgrowth of previous work but the emphasis of this paper will be to present and assess the direction of their evolution now. The models discussed are generally of very recent origin. No attempt has been made to include all recent models dealing with marine biological systems. Instead, models are selected and discussed for a variety of approaches, with examples taken from terrestrial ecology and other branches of biology where appropriate. To facilitate organization of the discussion, models are considered to belong somewhere in the following hierarchy: (1) ecosystem models; (2) productivity models; (3) population models; and (4) process models.

PB-257 091/9GA PC$7.50/MF$3.00
Environmental Research Lab., Corvallis, Oreg.
Water Quality Criteria Research of the U.S. Environmental Protection Agency. Proceedings of an EPA-Sponsored Symposium on Marine, Estuarine and Fresh Water Quality--Presented at the 26th Annual Meeting of the AIBS, on August 1975.
Jul 76, 194p EPA/600/3-76/079

Descriptors: *Marine biology, *Estuaries, *Fresh water biology, *Meetings, Phosphorus, Nitrogen, Trace elements, Stream flow, Bioassay, Cold weather tests, Aquatic biology, Malathion, Toxicity, Great Lakes, Phytoplankton, Mathematical models, United States.
Identifiers: Ecosystems, Trophic level.

These proceedings include a cross-sectional representation of the broad base ecological effects research programs conducted by research laboratories of the EPA Office of Health and Ecological Effects. The presentations focus on microbial and abiotic degradation processes, the problem of trace metals, the effects of toxic organics, and the feasibility of new stress-measuring methodologies in the marine environment. The freshwater segment of the symposium addresses the transport and biological modeling capabilities of the laboratories, cold climate aquatic biology, lake trophic states in the eastern United States, and the impact of toxic substances on freshwater systems.

PB-257 353/3GA PC$6.75/MF$3.00
Alaska Univ., College. Inst. of Marine Science.
The Arctic Coastal Environment of Alaska. Volume I. The Nearshore Marine Environment in Prudhoe Bay, Alaska,
H. M. Feder, D. G. Shaw, and A. S. Naidu. Mar 76, 167p IMS-R76-1, Sea Grant-76-3, NOAA-76060210
Grant NOAA-04-5-158-35

Descriptors: *Marine biology, *Marine geology, *Geochemistry, *Coasts, *Prudhoe Bay, Radiocarbon dating, Benthos, Abundance, Construction, Sediments, Ocean environments, Primary biological productivity, Arctic regions, Aquatic animals, Hydrocarbons, Water pollution, Alaska.
Identifiers: Sea Grant program.

Volume I of this report considers the results of three investigations; biological, geological, and hydrocarbon chemistry conducted in Prudhoe Bay and approaches in August 1974. The three studies are closely interrelated. The investigations described in Volume I were at and near the site of a causeway construction project on the west side of Prudhoe Bay, and had as their objectives: (1) Biology-document the distribution and density of benthic animals in order to develop a benthic biological base; (2) Geology-document the grain size distributions, geochemical properties, sources of and movements of the sediment; and correlate this information with the habitat preferences of the benthic animals; (3) Chemistry-survey the kinds and amounts of hydrocarbons present in the biota and sediments.

PB-257 465/5GA Not available NTIS
Washington Univ., Seattle. Dept. of Oceanography.

Nutrient Submodels and Simulation Models of Phytoplankton Production in the Sea,
John J. Walsh, and Richard C. Dugdale. 1972, 21p Contrib-655, NSF/IDOE-76-128
Pub. in Nutrients in Natural Waters, Chapter 6 p171-191 1972.

Descriptors: *Marine biology, *Nutrients, *Phytoplankton, *Upwelling, Mathematical prediction, Partial differential equations, Nonlinear differential equations, Systems analysis, Outfall sewers, Spatial distribution, Real time, Inorganic nitrates, Inorganic phosphates, South Pacific Ocean, Peru, Coasts.
Identifiers: Reprints, International Decade of Ocean Exploration, Ecosystems, *Trophic level.

Simulation models of marine ecosystems are being developed in the laboratory so that the rapid flood of data from contemporary continuous data acquisition systems can be interpreted, synthesized, and understood by workers in the field. The models consist of sets of coupled nonlinear partial differential equations describing the temporal and spatial distribution of nutrients and phytoplankton. This degree of nonlinear and spatial complexity makes it difficult or impossible to describe the system in mathematical form sufficiently simple to allow an analytical solution. The modeling approach employed to study nutrient and phytoplankton processes in two systems, upwelling and marine outfalls, is presented.

PB-257 521/5GA PC$4.00/MF$3.00
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, Miss.
A Report on Mississippi-Alabama Sea Grant January 1, 1974 - June 30, 1975.
30 Jun 75, 48p MASGP-76-001, NOAA-76061406
Grant NOAA-04-3-158-53
See also COM-74-11764.

Descriptors: *Oceanographic data, *Research projects, *Grants, Project planning, Law(Jurisprudence), Pollution, Engineering, Fisheries, Industries, Mississippi, Alabama, Budgeting, Education, Oceanographic surveys, Land development, Ocean environments, Coasts, Federal budgets.
Identifiers: Sea Grant program.

This is a mid-year report of the Mississippi-Alabama Sea Grant Program. It gives a description of many of the projects in progress sponsored by the Sea Grant Program. These projects are broken down into three areas which are education, research, and advisory services. A list of publications developed under the program, and a budget summary are also included.

8B. Cartography

AD-A029 443/9GA PC$3.50/MF$3.00
Army Engineer Topographic Labs Fort Belvoir Va
The State of the Art of Slope Mapping.
Research note,
Richard D. Sands. Aug 76, 17p Rept no. ETL-0060

Descriptors: *Mapping, *Slope, Stereophotogrammetry, Image processing, Lenses.
Identifiers: Automatic mapping, Image enhancement.

The state of the art of slope mapping techniques is reviewed from the point of view of recommending one for adoption by the Army for use in the field by topographic battalions. A technique using a standard copy camera and an existing orbital lens device is selected as the most practical for field use.

E76-10422 PC$3.50/MF$3.00
Institute of Scientific and Industrial Research (Sri Lanka).
Investigation of the Agricultural Resources in Sri Lanka.
Technical rept. Aug 75-Jun 76,
A. T. M. Silva, S. D. F. C. Nanayakkara, and L. S. K. B. Herath. Jun 76, 16p NASA-CR-148298

Descriptors: *Agriculture, *Ceylon, Ground truth, Forests, Topography, Earth resources program, Photogrammetry, Thematic mapping, Terrain analysis.
Identifiers: Image processing, Sri Lanka.

The author has identified the following significant results. It is observed that Landsat data is easily adaptable to photogrammetric techniques. With such adaptations, revision of topographic or thematic maps can be performed at very little cost. Revision of maps up to scale 1:100,000 (or better) can be performed. The Landsat image has definite advantages over the standard methods in areas of extensive development where the synoptic view of the Landsat image offers the required control in the form of distant mapped data in one frame. Portions of this document are not fully legible.

PB-257 030/7GA PC$3.50/MF$3.00
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
Microcopying Wildland Maps for Distribution and Scanner Digitizing.
Forest Service research paper (Final),
Elliot L. Amidon, and E. Joyce Dye. 1976, 18p FSRP-PSW-114

Descriptors: *Mapping, *Microfilm, Photocopying, Data storage.
Identifiers: *Microfiche, Computer applications.

Images in graphic or printed form can be reduced in size by microcopying. Microform is a collective term for stored microimages. Conventional microform films include silver halide, nonsilver diazo, vesicular, and color. Criteria for selecting the proper format include map quadrangle size and reduction ratio. Among several competing types of microforms, only microfilm and microfiche were judged acceptable for application to wildland maps. Microimages can be digitized by automatic techniques. With careful planning, it is possible to digitize automatically forest map microimages for input to computerized mapping systems. Other benefits of microcopying include a reduction in the cost of handling and shipping the original documents, savings in space, and making archival copies more lasting.

8C. Dynamic Oceanography

AD-A029 248/2GA PC$6.75/MF$3.00
Washington Univ Seattle Dept of Oceanography
Greenland Sea Studies. Part IV.
Final Technical rept. 1 Jun 71-31 May 73,
Knut Aagaard. 4 Aug 76, 157p Rept no. Ref-M76-66
Contract N00014-67-A-0103-0023
Doctoral thesis.

Descriptors: *Ocean currents, *Greenland Sea, Heat flux, Tides, Velocity, Sea ice, Power spectra, Seasonal variations, Drogue parachutes, Wind velocity, Oceanographic data, Field conditions, Theses.
Identifiers: West Spitsbergen current.

The West Spitsbergen Current flows north through the eastern Greenland Sea. The Greenland Sea is in turn the major avenue of exchange of mass and of thermal and kinetic energy between the Arctic Ocean and the rest of the world ocean. The flow through Bering Strait into the Arctic Basin is about 1.5 Sv (1 Sv = 1,000,000 cu m/sec) and < 1 Sv flows in through the Barents Sea, while about 2 Sv exit through the Canadian Archipelago. In contrast, the transport through the Greenland-Spitsbergen passage is about 7 Sv in each direction. In addition to the transport of heat and mass by the mean flow, much of the tidal energy in the Arctic Ocean enters through the Greenland-Spitsbergen passage.

AD-A029 358/9GA PC$5.00/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Baseline Data on the Oceanography of Cook Inlet, Alaska,
Lawrence W. Gatto. Jul 76, 95p Rept no. CRREL-76-25
Contract NASA-W-13452

Descriptors: *Oceanographic data, *Inlets(Waterways), Alaska, Data acquisition, Salinity, Surface temperature, Bathymetry, Sediments, Tides, Distribution, Flow rate, Turbulent flow, Coriolis effect, Seasonal variations, Aerial photography, Scientific satellites, Photointerpretation.
Identifiers: *Cook Inlet, Spaceborne photography.

The primary objective of this investigation was to compile baseline information pertaining to the ocean circulation, especially the extent and patterns of tidal currents and tidal flushing, in Cook Inlet, Alaska, utilizing aircraft and satellite imagery with corroborative ground truth data. LANDSAT-1 and NOAA-2 and -3 imagery provided repetitive, synoptic views of surface currents, water mass migration and sediment distribution during different seasons and tides. Color, color infrared and thermal infrared imagery acquired on 22 July 1972 with the NASA NP-3A aircraft were used to analyze currents, mixing patterns and sediment dispersion in selected areas. Temperature(C), salinity (0/00) and suspended sediment concentration (mg/l) data and hand-held photography were utilized as ground truth information in the interpretation of the aircraft and satellite imagery. Coriolis effect, semidiurnal tides and the Alaska current govern the estuary circulation. Clear, oceanic water enters the inlet on the southeast during flood tide, progresses northward along the east shore with minor lateral mixing, and remains a distinct water mass to the latitude of Kasilof-Ninilchik. South of the forelands, mixing with turbid inlet water becomes extensive. Turbid water moves south primarily along the north shore during ebb tide and a shear zone between the two water masses forms in mid-inlet south of Kalgin Island. Currents adjacent to and north of the forelands are complicated by tidal action, coastal configuration and bottom effects. Turbulence is greatest throughout the water column along the south shore and stratification is more pronounced in Kamishak and Kachemak Bays, especially when fresh water runoff is high.

AD-A029 500/6GA PC$3.50/MF$3.00
Naval Postgraduate School Monterey Calif
The Role of Surface Mixing in the Seasonal Variation of the Ocean Thermal Structure,
Robert L. Haney, and Robert W. Davies. 8 Sep 75, 8p
Availability: Pub. in Jnl. of Physical Oceanography, v6 n4 p504-510 Jul 76.

Descriptors: *Sea water, Temperature, *Ocean models, Vertical orientation, Seasonal variations, Thermal analysis, Marine meteorology, Mixing, Heat flux, Convection(Heat transfer), Wind, Surfaces, Interactions, Reprints.
Identifiers: *Ocean temperature.

The model described contains several empirical parameters such as the coefficient of vertical eddy diffusion and a wind mixing parameter m whose true values in the real ocean are not well known. In addition, the model is based upon a simplified diagnostic expression for the mixing depth h. However, the true values of the empirical parameters are perhaps not much different

from the values used in the model and the expression for h should be quite accurate during the stable time of the year when surface-generated mixing is most effective in influencing the thermal structure. Accordingly, at least the general qualitative features of the above results should be applicable to the real ocean and these clearly show that surface-generated wind and convective mixing play an important role in determining the detailed evolution of the seasonal temperature structure, especially that at the surface.

AD-A029 637/6GA PC$4.50/MF$3.00
Wyoming Univ Laramie
Statistical Properties of Fast Fourier Transform Coefficients Computed from Real-Valued, Covariance-Stationary, Periodic Random Sequences.
Research paper,
Leon E. Borgman. Jul 76, 67p RP-23, CERC-TP-76-9
Contract DACW72-72-C-0001

Descriptors: *Fast Fourier transforms, Coefficients, *Ocean waves, *Spectrum analysis, *Computer programs, Power spectra, Directional, Spectra, Statistical processes, Probability.
Identifiers: *Ocean wave spectra.

A systematic development of the probability properties of fast Fourier transform coefficients is presented as part of an investigation of the Statistical precision of ocean wave directional spectra. Since the spectra were computed on the basis of the fast (finite) Fourier transform coefficients of the water level elevation, the probabilistic variations are quite relevant to the overall problem. This development satisfies the purpose of providing a consistent set of conventions and definitions for the investigation. The current importance of the fast Fourier transform in data analysis is the availability of many computer programs for rapid computation of the coefficients. Its use and results are available in various reference, but some lack clear expression in the literature. Hence, this compilation assembles these varied results in a coherent, unified development. (Author)

AD-A029 638/4GA PC$5.50/MF$3.00
Wyoming Univ Laramie
The Statistical Anatomy of Ocean Wave Spectra.
Research rept.,
Leon E. Borgman. Jul 76, 105p RR-73-1, CERC-TR-76-10
Contract DACW72-C-0001

Descriptors: *Ocean waves, *Wave analyzers, *Hurricanes, Nonlinear systems, Statistical analysis, Mexico Gulf, Chi square test, Directional.
Identifiers: Hurricane Carla, Drilling platforms, Oil rigs, Texas towers, Spectral density, Coastal engineering.

The statistical variations in wave energy spectral estimates for hurricane waves are examined empirically for 12 separate intervals of wave records measured during Hurricane Carla in September 1961. Measurements were made on a Chevron Oil Company platform in South Timballer Block 63, Gulf of Mexico, at a water depth of 100 feet. Hurricane waves were chosen for the analysis because these waves show, in exaggerated form, the effects of departures from linearity on the statistical variability in spectral estimates. This report gives the analysis for Hurricane Carla and develops certain implications and consequences of the empirical results. (Author)

AD-A029 639/2GA PC$4.00/MF$3.00
Coastal Engineering Research Center Fort Belvoir Va
Wind-Generated Waves for Laboratory Studies.
Technical paper,
D. Lee Harris. Aug 76, 46p Rept no. CERC-TP-76-12

Descriptors: *Water waves, Wind tunnel tests, Coastal regions, Interfaces, Model basins, Mathematical prediction, Drag, Flow fields, Scaling factors.
Identifiers: Wave generators, Wind generated waves, Coastal engineering, Air water interactions.

Mechanically generated, regular waves are used in laboratory wave basins and channels for testing engineering designs for the coastal zone. Wind-generated waves in the laboratory display irregularity, suggestive of the irregularity of the open sea. It has been suggested that the validity of laboratory tests would be increased if the laboratory waves were generated by wind. Examination of a simple approach to wave forecasting, based on dimensional analysis, leads to the conclusion that wind-generated waves in the laboratory cannot be expected to have the same form as prototype waves unless they correspond to equivalent scaled fetches. Very low windspeeds must be used to produce waves that are anywhere near fully developed in a laboratory facility of moderate length. The resulting waves are too small to be of much value in testing designs. An examination of the microscale procedures, now believed to be responsible for wave growth and of some secondary flow characteristics of wind tunnels, indicates that the relative importance of the mechanisms for wave generation in wind channels is very different from that in unconfined airspaces.

PB-256 641/2GA PC$7.50/MF$3.00
Oregon State Univ., Corvallis. School of Oceanography.
Physical Oceanographic Observations Off the Oregon Coast, 1975. WISP and UP-75,
W. E. Gilbert, A. Huyer, E. D. Barton, and R. L. Smith. Apr 76, 193p Data-64, Ref-76-4, NSF/IDOE-76-120
Grants NSF-DES74-22290, NSF-IDO71-04211

Descriptors: *Ocean currents, *Upwelling, Mooring, Flowmeters, North Pacific Ocean, Winter, Time series analysis, Wind(Meteorology), Velocity measurement, Conductivity, Temperature measurement, Salinity, Oceanographic data, Density(Mass/volume), Spring season, Continental shelves, Spectrum signatures, Tables(Data), Hydrography, Coasts, Oregon.
Identifiers: International Decade of Ocean Exploration.

The report presents observations from two programs in 1975, WISP and UP-75 to study circulation off Oregon. WISP was a study of the transition between the winter and spring regimes, and UP-75 was designed to determine whether there is a poleward undercurrent along the continental slope during the upwelling season. During WISP, eleven current meters were moored in three arrays across the shelf at 45 degrees N from late January to late April, and hydrographic sections were made at intervals of several weeks from late January to mid-May. All current meters successfully measured velocity and temperature; ten also measured conductivity. This data report presents the hourly data from the current meters, including time series of salinity and sigma-t; the hydrographic data; and low frequency time series of wind, adjusted sea level and the parameters measured from the current meters.

PB-256 810/3GA Not available NTIS
Oregon State Univ., Corvallis. School of Oceanography.
Some Three-Dimensional Characteristics of Low-Frequency Current Fluctuations Near the Oregon Coast,
Pijush K. Kundu, and J. S. Allen. 25 Apr 75, 20p NSF/IDOE-76-136
Grants NSF-GX-28746, NSF-GX-33502
Sponsored in part by Grant NSF-IDO71-04211.
Pub. in Jnl. of Physical Oceanography, v6 n2 p183-199 Mar 76.

Descriptors: *Ocean currents, *Coasts, *Continental shelves, Three dimensional flow, Upwelling, Flowmeters, Velocity measurement, Pressure measurement, Density(Mass/volume), Stratification, Time series analysis, Turbulence, Oregon, North Pacific Ocean.
Identifiers: Reprints, International Decade of Ocean Exploration, Baroclinicity.

An analysis is presented of the low-frequency fluctuations of the currents near the Oregon coast, based on the 1972 and 1973 measurements from moored current meters in CUE-1 and CUE-2. Let u and v denote the eastward and northward components of the currents. The standard deviation of v is approximately depth-independent whereas that of u decreases with depth. As one approaches the coast, the standard deviation of u decreases whereas that of v rises steeply, consistent with the behavior expected of coastally trapped wave motion. A scatter plot of the velocity fluctuations in a hodograph plane indicates that the fluctuations roughly follow the direction of the local isobaths. The Reynolds stresses in an east-north coordinate system therefore change sign because of the change of direction of the isobaths in the region. The v fluctuations seem to be mutually better correlated than the u fluctions throughout the region, suggesting that the u components may be affected by 'turbulence.' A method for performing the empirical orthogonal decomposition for two-dimensional vector time series has been formulated and applied to the velocity field over the continental shelf.

PB-257 229/5GA PC$4.50/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
Linearized Long Wave, Numerical Model of the Hawaiian Islands,
Eddie N. Bernard. Jun 75, 51p HIG-75-13, NOAA-JTRE-136, , NOAA-76061411
Grant NOAA-04-3-022-30

Descriptors: *Tsunamis, *Hawaii, Mathematical models, Partial differential equations, Interpolation, Interactions.
Identifiers: Spline interpolation.

A numerical model simulating linearized long waves interacting with the seven major Hawaiian islands is presented. A spline interpolation scheme is utilized to convert the actual soundings of the island bathymetry to a 5.5-km-square grid closely approximately the topography of the islands. A time marching, central difference, explicit scheme is used to evaluate the wave field by the linear, Eulerian equations of motion and continuity in Cartesian coordinates for a frictionless homogeneous fluid. The condition of nonnormal flow is employed at the island shorelines and a localized interpolation technique is utilized at the outer boundary to simulate a free-flow boundary. Verification of the numerical procedure is accomplished by agreement with analytic solutions of steady-state problems involving wave interaction with geometric islands in both constant and variable depth cases. A test run from the north is illustrated and selected wave records are shown.

PB-257 249/3GA PC$3.50/MF$3.00
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
Seasonal Surface Currents Off the Coasts of Vancouver Island and Washington as Shown by Drift Bottle Experiments, 1964-65.
Special scientific rept.-Fisheries series,

W. James Ingraham, Jr., and James R. Hastings. May 76, 16p NOAA-TR-NMFS-SSRF-699, NOAA-76060306

Descriptors: *Ocean currents, Ocean surface, North Pacific Ocean, Fisheries, Drift indicators, Circulation, Water flow, British Columbia, Seasonal variations, Coasts, Vancouver Island, Washington(State).

Release of a total of 1,044 drift bottles during four periods from April 1964 to January 1965 off the coasts of Washington and Vancouver Island, British Columbia, indicate a seasonal reversal of flow, southward in April and July and northwards in November and January, within 200 km (108 nautical miles) of the coast. This study supplements those conducted off the Oregon and California coasts by other agencies.

PB-257 523/1GA PC$4.00/MF$3.00
National Oceanic and Atmospheric Administration, Rockville, Md.
Passage of Anticyclonic Gulf Stream Eddies Through Deepwater Dumpsite 106 during 1974 and 1975,
James J. Bisagni. Apr 76, 46p NOAA-Dumpsite Evaluation-76-1, NOAA-76060301
Prepared by National Marine Fisheries Service, Narragansett, R.I. Atlantic Environmental Group. See also report dated Dec 75, PB-252 657.

Descriptors: *Ocean currents, *Eddies, *Solid waste disposal, *Water pollution, *North Atlantic Ocean, Deep water, Bathythermograph data, Infrared mapping, Scientific satellites, Seasonal variations, Maps, Oceanographic surveys, Oceanographic ships, Continental slopes, Continental rises, Gulf Stream, New York Bight.
Identifiers: Ocean waste disposal, Ocean dumping, Deepwater Dumpsites.

The formational theory and characteristics of anticyclonic Gulf Stream eddies in the western North Atlantic Ocean are summarized. Their occurrence, trajectories, and structure, are observed using XBT data and infrared satellite imagery to relate their passage through Deepwater Dumpsite 106 off the New York Bight and over the continental slope and rise. The frequency with which these eddies pass through the dumpsite, their residence times within the dumpsite, and the total time they occupy the dumpsite each year are computed to determine their potential effects on ocean dumping.

8D. Geochemistry

AD-A029 476/2GA PC$3.50/MF$3.00
Hawaii Inst of Geophysics Honolulu
Trace Element Geochemistry of Biogenic Sediments from the Western Equatorial Pacific,
William C. Burnett. 20 Jun 74, 9p Rept no. HIG-Contrib-590
Contract N00014-70-A-0016-0001
Availability: Pub. in Pacific Science, v29 n2 p219-225 1975.

Descriptors: *Geochemistry, *Trace elements, *Ocean bottom soils, *Sediments, *Pacific Ocean, *Equatorial regions, Ocean bottom, Minerals, Metals, Transition metals, Alkaline earth metals, Reprints.
Identifiers: Biogenic sediments.

Twenty-seven surface samples of biogenic sediment, including radiolarian, nannofossil, and foraminiferal oozes from the Western Equatorial Pacific have been analyzed for potassium, magnesium, iron, rubidium, strontium, barium, chromium, cobalt, nickel, copper, and zinc by rapid instrumental techniques. Interelement associations have been evaluated with the use of a computer-compiled matrix of correlation coefficients. The variables considered include elemental determinations, water depth, and percentage of calcium carbonate. The associations calcium carbonate:strontium, potassium:rubidium, and barium:nickel:copper may all be explained with regard to their mode of entry into the sediment. The data indicate that organic fixation of metals is a significant process during the deposition of Pacific Equatorial sediments, whereas contributions from other sources, i.e., sorbed cations on the surfaces of clays and coprecipitation with iron or manganese oxides, are effectively masked in most cases by high rates of biogenous deposition. (Author)

PB-257 099/2GA PC$4.00/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
Contributions to the Geochemistry of Nazca Plate Sediments, Southeast Pacific. 1. Geochemical Investigations of Sediments Across the Nazca Plate at 12S.
Master's thesis,
Gary M. McMurtry. Jun 75, 49p HIG-75-14-PT-1, NSF/IDOE-76-146
Grant NSF-GX-28674
See also PB-257 100.

Descriptors: *Sediments, *Undersea mineral deposits, *Geochemistry, *South Pacific Ocean, Metals, Ocean bottom, Mineralogy, Metalliferous mineral deposits, Ocean basins, Iron, Manganese, Nickel, Copper, Cobalt, Chromium, Aluminum oxides, Chemical analysis, Tables(Data), Theses.
Identifiers: Nazca Plate, International Decade of Ocean Exploration.

The mineralogy, chemical compositions and metal accumulation rates of near-surface sediments have been investigated across the Nazca lithospheric plate at approximately 12 degrees S. Analyses have been made of the top and bottom intervals of eighteen free-fall and gravity cores. Three general sediment types have been recognized: continental, biogenic and metalliferous. The distributions of Fe, Mn, Cu, Ni, Co and Cr in ratio to Al2O3 in the sediments across the Nazca plate show greatest enrichment in the Bauer Deep for Fe, Mn, Ni and Cu. Accumulation rates, based on sedimentation rates by the excess 230Th method, are highest in the Bauer Deep for Fe, Mn, Ni and Cu when compared to accumulation rates on the East Pacific Rise, the Galapagos Rise and the eastern Nazca plate. Anomalously high heat flow values for this oceanic basin have been correlated to the geochemical data, which have been interpreted as evidence for localized hydrothermal metallogenesis in the Bauer Deep.

PB-257 100/8GA PC$4.50/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
Contributions to the Geochemistry of Nazca Plate Sediments, Southeast Pacific. 2. Possible Sources of Metals in Pelagic Sediments--with Special Reference to the Bauer Basin.
Master's thesis,
Robert J. Oldnall. Jun 75, 59p HIG-75-14-Pt-2, NSF/IDOE-76-146-1
Grant NSF-GX-28674
See also PB-257 099.

Descriptors: *Sediments, *Volcanism, *Marine biology, *Undersea mineral deposits, *South Pacific Ocean, *Bauer Basin, Metals, Ocean bottom, Metalliferous mineral deposits, Plankton, Barium, Zinc, Lead(Metal), Strontium, Iron, Manganese, Copper, Nickel, Geochemistry, Ocean basins, Theses.
Identifiers: Nazca Plate, International Decade of Ocean Exploration.

A review of studies of volcanic processes and the composition of marine organisms suggests that both volcanic and biologic mechanisms contribute transition and some other metals to the sediments of the Bauer Basin, southeastern Pacific. Deep circulating hydrothermal fluids are concluded to be the most likely volcanic source. Marine plankton are shown to accumulate metals in the surface waters by metabolic processes and by adsorption. Their sinking hard parts transport the metals to pelagic sediments. A table of the elemental compositions of marine plankton has been compiled from the available literature. Comparison of Bauer Basin sediments with the composition of some hard-shelled plankton indicates that organisms may supply sufficient amounts of Ba, Zn, Pb, and Sr to account for these metals in the sediment. Most of the Fe and Mn contents and a substantial part of the Ni and Cu, however, are best explained by precipitation from hydrothermal fluids.

8F. Geography

E76-10451 PC$6.75/MF$3.00
Direccion de Cartografia Nacional, Caracas (Venezuela).
Development of Techniques to Simplify the Process of Investigation and Estimate of Natural Resources in Remote and Relatively Unexplored Areas, Venezuela.
Final rept.,
Adolfo C. Romero. 1976, 162p NASA-CR-148560
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: *Venezuela, Rivers, Geological faults, Rocks, Drainage patterns, Alluvium, Forests, Vegetation, Earth Resources Program, Side-looking radar, Mapping.

The author has identified the following significant results. Based upon the results obtained by both interpretations, radar and satellite, highly fractured zones were outlined and checked against geologic rock samples. Most of the rock samples were collected along the Ventuari River that crosses most of the project area from NE to SE. The structural orientation and fracture patterns were taken into consideration during the planning of flight lines, also the magnetic declination of the area. Most of the flight lines were oriented N 30 deg W across known structural trends; the altitude above ground was 450 feet, and the distance between lines was 3000 feet. The ERTS image permits the obtention of a panoramic vision of the area, and facilitates the exact delineation of major drainages. Topographic changes are easily observed. Rocky outcrops are easily distinguishable on band 5 and 7. Shrub vegetation zones are distinguishable on both bands, without possible separation of forest types, this is possible only when the physiographic conditions of small textural differences are taken into account.

E76-10456 PC$7.50/MF$3.00
Pennsylvania State Univ., University Park. Office for Remote Sensing of Earth Resources.
Interdisciplinary Applications and Interpretations of ERTS Data Within the Susquehanna River Basin.
Final rept. 1 Jun 72-30 Apr 75,
G. J. McMurtry, and G. W. Petersen. Dec 75, 82p ORSER-SSEL-TR-12-75, NASA-CR-148587
Contract NAS5-23133
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Pennsylvania, Land use, Mineral exploration, Forests, Strip mining, Infestation, Hydrology, Geology, *Susquehanna River Basin(Md-Ny-Pa), Earth Resources Program, Multispectral band scanners, Digital data, Mapping, Pattern recognition.

The author has identified the following significant results. The full potential of high quality data is achieved only with the application of efficient and effective interpretation techniques. An excellent operating system for the handling, processing, and interpreting ERTS-1 and other MSS data was achieved. Programs for processing digital data are implemented on a large nondedicated general purpose computer. Significant results were attained in mapping land use, agricultural croplands, forest resources, and vegetative cover. Categories of land use classified and mapped depend upon the geographic location, the detail required, and the types of lands use of interest. Physiographic and structural provinces are spectacularly displayed on ERTS-1 MSS image mosaics. Geologic bedrock structures show up well and formation contacts can sometimes be traced for hundreds of kilometers. Large circular structures and regional features, previously obscured by the detail of higher resolution data, can be seen. Environmental monitoring was performed in three areas: coal strip mining, coal refuse problems, and damage to vegetation caused by insects and pollution.

PB-256 722/0GA PC$4.00
Florida State Univ., Tallahassee.
Major Features of the Apalachicola Bay System: Physiography, Biota, and Resource Management,
Robert J. Livingston, Richard L. Iverson, Robert H. Estabrook, Vernon E. Keys, and John Taylor, Jr. 1974, 29p NOAA-76052805
Grant NOAA-04-3-158-43
Prepared in cooperation with Florida State Div. of Health, Jacksonville. Sponsored in part by Florida Dept. of Pollution Control, Tallahassee, and Franklin County Board of County Commissioners. Pub. in Florida Scientist, v37 n4 p245-271 1974.

Descriptors: *Bays(Topographic features), *Geomorphology, *Primary biological productivity, *Apalachicola Bay, Oceanographic surveys, Natural resources, Management, Watersheds, Dredging, Sewage disposal, Water pollution, Estuaries, Aquatic biology, Florida.
Identifiers: Reprints, Sea Grant program, *Marine resources, *Resource management.

A review was made of various features of the Apalachicola Bay System. Unique physical, chemical, and biological features of this system combine to make it one of the most productive estuarine areas in the state of Florida. Primary productivity and secondary productivity are discussed in relation to various forcing functions (natural and man-induced). Problems associated with development include dredging, sewage effluents, pesticides and a number of up-river activities such as industrialization, cattle ranching, channelization, and damming. The Apalachicola Drainage System is viewed as one of the largest relatively unpolluted areas in the country. However, it is a neglected resource with little management or control; as such it is presently endangered by a number of activities.

8G. Geology and Mineralogy

AD-A029 441/3GA PC$4.00/MF$3.00
State Univ of New York At Stony Brook Dept of Earth and Space Sciences
Mechanical Properties of Granular Silicates at Depth.
Final rept. 1 Jul 75-30 Jun 76,
Neville Carter. 1 Aug 76, 28p AFGL-TR-76-0183
Contract F19628-76-C-0048

Descriptors: *Silicates, *Quartzite, *Recrystallization, *Geology, Stresses, Grain size, Earth crust, Minerals, High temperature, High pressure.
Identifiers: *Silicate minerals, Triaxial tests.

Granular silicates comprise a substantial part of the Earth's crust, and yet there have been few attempts at determining their physical properties and flow processes experimentally. The goal of the research was to attempt to obtain these data, for a variety of granular silicates, at elevated temperatures and pressures, both in the presence and absence of pore fluids. The primary equipment to be used was Griggs-Heard 10 kb argon triaxial deformation apparatus because of the sensitivity required. Recrystallized grain sizes in wet quartzite deformed experimentally in the steady state show a marked inverse dependence on stress and are virtually independent of temperature and strain rate. This dependence, which is similar to that observed for dynamically recrystallized metals and olivine, is given by D = 6.5 Sigma to the minus 1.4th power where D is the new grain size in microns and sigma is the differential stress in kilobars. If these preliminary observations are substantiated, stress magnitudes during creep of quartzite in the crust may be determined directly for the first time.

E76-10459 PC$5.50/MF$3.00
Geological Survey, Reston, Va.
Evaluation of LANDSAT-1 Image Applications to Geologic Mapping, Structural Analysis and Mineral Resource Inventory of South America with Special Emphasis on the Andes Mountain Region.
Final rept. Jan 73-Jul 74,
William D. Carter. Jun 76, 114p NASA-CR-148590
NASA Order S-70243-AG
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Geology, *Mineral exploration, South America, Andes Mountains(South America), Oil exploration, Earth Resources Program, Copper, Photointerpretation.
Identifiers: LANDSAT-1 satellite.

The author has identified the following significant results. The discovery of copper mineralization along a lineament mapped in Area 7 (La Paz) has lent credence to the use of Landsat 1 data as a basic step in mineral exploration. In Area 9 (Copiapo Region), a number of lineaments were found to be associated with the largest copper deposits of the region. In Area 12 (Magallanes), the identification of what is believed to be a tertiary basin from Landsat 1 data has resulted in a new area for petroleum exploration. Band 7 images, as black and white transparencies, were found to be the most useful for geologic interpretation in both tropical vegetated areas and desert regions. Color composites made by the diazochrome process, chromaline process, and from color additive viewers provided additional information. Mosaics of Landsat 1 data covering 4 x 6 degrees of latitude and longitude compiled at the 1:1,000,000 scale were found to be an ideal size and format for most users.

E76-10460 PC$3.50/MF$3.00
Geological Survey, Reston, Va.
Evaluation of LANDSAT-2 (ERTS) Images Applied to Geologic Structures and Mineral Resources of South America.
Progress rept. 30 Jun 75-30 Jun 76,
William D. Carter, and William S. Kowalik. 1 Jul 76, 24p NASA-CR-148591

Descriptors: *South America, *Geology, Minerals, Chile, Bolivia, Earth Resources Program, Multispectral band scanners, Salts.
Identifiers: LANDSAT-2 satellite.

The author has identified the following significant results. The Salar of Coposa is located in northern Chile along the frontier with Bolivia. The surface was divided into six general classes of materials. Analysis of Landsat image 1243-14001 by use of interactive multispectral computer (Image 100) enabled accurate repetition of these general classes based on reflectance. The Salar of Uyuni is the largest of the South American evaporite deposits. Using image 1243-13595, and paralellopiped computer classification of reflectance units, the Salar was divided into nine classes ranging from deep to shallow water, water over salt, salt saturated with water, and several classes of dry salt.

PB-256 704/8GA Not available NTIS
Woods Hole Oceanographic Institution, Mass.
Marine Phosphorite Formation Off Peru,
Frank Manheim, Gilbert T. Rowe, and Dan Jipa. 21 May 74, 11p WHOI-Contrib-3341, NSF/IDOE-76-90
Contract N00014-66-C-241, Grant NSF-GX-33502
Prepared in cooperation with University of South Florida, St. Petersburg, Dept. of Marine Science, and Institutul Geologic, Bucharest (Rumania).
Pub. in Jnl. of Sedimentary Petrology, v45 n1 p243-251 Mar 75.

Descriptors: *Undersea mineral deposits, *Phosphate deposits, Foraminifera, Ocean bottom, Sediments, Calcium carbonates, Diogenisis, South Pacific Ocean, Peru.
Identifiers: Reprints, *Phosphorites, International Decade of Ocean Exploration.

Formation of contemporary phosphorite in the Peru-Chile offshore area is confirmed. Synthesis is believed to occur as a result of replacement of carbonate tests of Holocene benthonic Foraminifera in the interstitial waters of organic-rich sediments. Step-by-step phosphatization of Holocene benthic Foraminifera can be demonstrated. Four simultaneous requirements for formation of phosphorites are: (a) sediments rich in organic detritus blanketed by (b) water with low concentrations of dissolved oxygen, (c) low rates of inorganic (especially terrigenous) sedimentation and (d) low but not negligible concentrations of calcium carbonate in the sediment. Copyright (c) 1975 by The Society of Economic Paleontologists and Mineralogists.

PB-257 266/7GA PC$3.50/MF$3.00
Lamont-Doherty Geological Observatory, Palisades, N.Y.
Gravity, Magnetics, and Seismicity,
James R. Cochran, and Manik Talwani. May 76, 25p LDGO-2200, NOAA-76061402, , Atlas-Mono-9
Contract N00014-67-A-0108-0004, Grant NSF-GA-27281
Sponsored in part by National Science Foundation, Washington, D.C. Grants NSF-GP-5536, NSF-GA-19030. Report on MESA New York Bight. Prepared in cooperation with New York Sea Grant Inst., Albany.

Descriptors: *Ocean bottom topography, *New York Bight, *Geophysical prospecting, Gravity, Magnetic anomalies, Sediments, Continental shelves, Ocean basins, Submarine topography, Seismic surveys, Marine geology, Coastal topographic features, Measuring instruments, Instrumentation.
Identifiers: Sea Grant program, Oceanographic equipment.

Free-air gravity and total-intensity magnetic anomalies in the New York Bight region, presented as profiles along ships' tracks, are dominated by prominent positive and negative bands. Those on the outer edge of the continental shelf and on the continental slope are associated with the transition from the North American continent to the Atlantic Ocean. Those on the inner shelf are associated with structures inherited from the region's geology

prior to the formation of the present Atlantic Ocean. Although the Bight region is not particularly active seismically, numerous small to moderate earthquakes have occurred. The cause of the seismic activity is not well understood.

8H. Hydrology and Limnology

AD-A029 143/5GA PC$4.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Effects of Flood Flows on Water Quality of Tioga-Hammond Lakes; Hydraulic Model Investigation.
Final rept. Mar 74-Dec 75,
Mark S. Dortch. Aug 76, 46p Rept no. WES-TR-H-76-11

Descriptors: *Lakes, *Floods, *Water quality, Alkalinity, Acids, pH factor, Water flow, Water analysis, Models, Flood control, Water pollution, Dams.
Identifiers: *Hammond Lake, *Tioga Lake, *Hydraulic models.

The physical model investigation was conducted to estimate the dilution and dispersion of acidic and alkaline substances within Tioga-Hammond Lakes as a result of flood flows and to determine the concentration of these substances in the outflow during drawdown. The model, constructed to a distorted length scale ratio of 1:100 vertically and 1:2000 horizontally, consisted of Tioga and Hammond Lakes, the connecting channel of the dual reservoir system, Hammond outlet works, and the flood control intakes of Tioga outlet works. The model simulated density variations and stratifications expected to exist in the prototype due to temperature differences and reproduced the unsteady inflow and outflow hydrographs for various size floods. Concentrations of fluorescent dyes simulated the acidic and alkaline substances; water samples were collected and analyzed to determine the dilution and dispersion of the dyes throughout the lakes and in the outflow from the lakes. The expected concentrations of acidic and alkaline substances existing in the two lakes after flood inflows and drawdown and in the outflow during drawdown are presented for three flood conditions. The results provide information for estimating water quality for similar flood conditions within and downstream of the project and guidance for limiting adverse quality during drawdown. (Author)

PB-256 207/2GA PC$4.00/MF$3.00
Vermont Univ., Burlington. Dept. of Geography.
Vegetation Mapping in Lake Champlain Wetlands.
Completion rept. 1 Jan-30 Jun 75,
Aulis O. Lind, and William G. Howland. Jul 75, 41p W76-11111, , OWRT-A-022-Vt(1)

Descriptors: *Vegetation, *Lake Champlain Basin, *Remote sensing, Mapping, Aerial photography, Photointerpretation, Color photography, Stereophotography, Classifications, Missisquoi River Delta, Lamoille River Delta, Vermont.
Identifiers: *Wetlands, Plant associations.

Detailed canopy vegetation maps at a scale of 1:20,000 have been produced for two major wetlands in the Missisquoi and Lamoille River Deltas of the Lake Champlain Basin, based on the interpretation of medium-high altitude color aerial photography. Photo interpretation was visual through use of a Bausch and Lomb Zoom 240 stereoscope. Signatures were established for a classification of thirteen canopy types. Species composition, relative dominance, canopy height and other characteristics of canopy associations are discussed. Ground control was achieved in summer of 1975 through a rigorous program of field survey. Methodology is carefully outlined for future studies of a comparative nature.

PB-256 210/6GA PC$5.00/MF$3.00
Utah Center for Water Resources Research, Logan.
A Survey of the Physical Limnology of Great Salt Lake.
Completion rept.,
Anching Lin. 1976, 88p W76-11107, , OWRT-A-029-UTAH(1)
Contract DI-14-31-0001-5045
Prepared in cooperation with Utah Geological and Mineralogical Survey, Salt Lake City.

Descriptors: *Limnology, *Stratification, *Great Salt Lake, Density(Mass/volume), Water flow, Mixing, Interfaces, Diffusion, Lake waves, Mathematical models, Turbulent flow, Dispersing, Utah.

The study summarizes some results of physical processes on the Great Salt Lake. Of some interest to limnologists is the meromixis (sustained two-layer stratification) in the south basin. The conspicuous two-layer was made possible by the presence of the railroad causeway. The stable stratification is demonstrated in the records of the last 15 years. The rate of entrainment of the chemocline obeys the general rules applicable to other large two-layer basins. The large-scale motion takes place more than 50 percent of the time. In the winter, the lake is calmer and most violent in late spring and early summer. The period of the fundamental surface wave was 6.0 hours on the record as compared to 5.43 hours obtained from a computation for the frictionless, rotationless Great Salt Lake. The discrepancy is accounted for by the effect of rotation and damping with a prognostic model.

PB-256 568/7GA PC$3.50/MF$3.00
California Univ., Davis. Water Science and Engineering Section.
Computer Program for Three-Dimensional Plottings from Irregular Finite Element Grid,
Sumant K. Gupta, Michael W. Morrisey, John Lonczak, and Kenneth K. Tanjii. Mar 76, 23p
Paper-4010, W76-11327
Also pub. as California Univ., Davis. Water Resources Center, UCAL-WRC-W-438.

Descriptors: *Ground water, *Finite element analysis, *Computer programs, *Computer graphics, Plotting, River basins, Computation, Sutter Basin, California, FORTRAN.

Three-dimensional plotting provides a means for interpretation and illustration of results and dynamic findings from finite element simulation. However, the computer graphic package as available at various computer centers requires data on a regular grid. It cannot be adopted for isoparametric finite elements since the elements are combinations of various shapes and sizes of trapezoids. Computer programs have been developed to interpolate the data from irregular finite element grid such that three-dimensional plottings can be generated to depict results from two or three dimensional finite element solution. The program developed has the option of generation of plots as viewed from various angles, varying number of contours and vertical scale. The capabilities of this program are illustrated by using specific examples of 3-D finite element solution of groundwater flow, Sutter Basin, California.

PB-256 761/8GA PC$4.50/MF$3.00
Florida Univ., Gainesville. Water Resources Research Center.
Petrographic and Geohydrologic Model of Aquifer Limestones in Florida.
Technical completion rept.,
Anthony F. Randazzo. 2 Jul 76, 57p WRRC-Pub-35, W76-11493, , OWRT-A-025-FLA(3)
Contract DI-14-34-0001-6010
Prepared by Florida Univ., Gainesville. Dept. of Geology.

Descriptors: *Hydrology, *Aquifers, *Limestones, *Florida, Dolomite(Mineral), Calcite, Porosity, Permeability, Diagenesis, Petrography, Ground water.

Petrographic analysis of 14 cores penetrating the Inglis and Avon Park Formations (Floridan Aquifer) reveals several distinct lithofacies representing multiple regressive-transgressive cycles, aerial exposure, and diagenesis. Evolution of pore spaces varies with the lithofacies and is a function of primary deposition and diagenetic history. The general tendency has been toward obliteration of primary voids by compaction and calcite and dolomite infilling, but several zones have experienced dissolution enlargement. There is evidence for penecontemporaneous dolomitization in a supratidal environment, as well as post-depositional dolomitization by Mg-rich groundwater flushing. Various dolomite textures can be used to predict the environment of dolomitization. The petrographic model presented provides the framework into which the known geohydrologic and hydrochemical models can be integrated.

PB-256 967/1GA PC$3.50/MF$3.00
Arizona Univ., Tucson. Lab. of Tree-Ring Research.
Riparian Dendrochronology: A Method for Determining Flood Histories of Ungaged Watersheds.
Completion rept. Jun 74-Jul 76,
David Laing, and Charles Wayne Stockton. Aug 76, 23p W76-11523, , OWRT-A-058-ARIZ(1)
Contract DI-14-34-0001-6003

Descriptors: *Watersheds, *Floods, *Age determination, *Trees(Plants), Land use, Plant growth, History, Snow, Climate, Exposure, Pine Creek, Bright Angel Creek, South Taylor Creek, Animos River, Arizona, Utah, Colorado, Grand Canyon, National parks.
Identifiers: *Flood damage, *Flood frequency, Snowpack, Escalante(Utah), Silverton(Colorado), Zion National Park.

Examination of 106 crossdated tree-ring cores from the riparian zone of Pine Creek near Escalante, Utah, 10 cores from Bright Angel Creek, Grand Canyon, Arizona, 8 cores from South Taylor Creek, Zion National Park, Utah, and 5 cores from the Animas River near Silverton, Colorado, has yielded the following information: (1) various riparian gymnosperm and angiosperm species crossdate with semi-arid site gymnosperms; (2) tree growth is best correlated with snowpack water equivalent; (3) Flood damage to trees is manifested in growth suppression on root exposure or burial, in reaction wood on tilting, and in scarring; (4) flood damage is very infrequent at Pine Creek from 1700 to 1880, more so from 1880 to 1909, and very frequent from 1909 to the present; (5) flood damage shows fairly constant frequency in the Bright Angel Creek watershed, which has seen little land use; (6) flood damage on South Taylor Creek shows a marked increase in frequency between about 1900 and 1937 when the region was included in Zion National Monument, after which flood damage declined markedly in frequency.

PB-257 059/6GA PC$7.75/MF$3.00
Clemson Univ., S.C. Water Resources Research Inst.
The Future of the Savannah River, Proceedings of a Symposium, Held at McCormick, South Carolina on October 14-15, 1975,
B. L. Dillman, and J. M. Stepp. Jun 76, 216p
W76-11877, , OWRT-A-999-SC(6)
Prepared in cooperation with Georgia Inst. of Tech., Atlanta. Environmental Resources Center and Georgia Univ., Athens. Inst. of Ecology.

Descriptors: *River basin development, *Savannah River, *Meetings, Water quality management, History, Electric power plants, Recreation, Sedimentation, Sediment transport, Dredging, Soil erosion, Channel improvements, South Carolina, Georgia.

These Proceedings include the major papers and invited discussions presented at the symposium. Major topics include: Historical perspective; Water quality planning and management; Electric power; Recreation; Sediment problems; Environmental resources; The Corps of Engineers' role.

8I. Mining Engineering

PB-255 871/4GA PC$5.50/MF$3.00
Bendix Corp., Ann Arbor, Mich. Energy, Environment, and Technology Office.
Logistic Performance of Continuous Miners.
Final rept.,
Leslie D. Marrus, Pryor McGinnis, and Conrad Rogne. Jan 76, 120p 4185, BuMines-OFR-87-76
Contract S0144087

Descriptors: *Coal mining, *Mining equipment, Reliability, Maintainability, Production rate, Preventive maintenance, Performance evaluation.
Identifiers: *Continuous miners.

This project and final report represent an effort to collect, analyze, and verify reliability and performance data on currently available medium-to-high seam models of continuous miners being used in underground coal mining. The analysis determined availability, mean time and tons between failures, amounts of down time associated with various failures, labor and part costs required to correct failures, and various indices of maintainability. Machine performance and reliability are discussed relative to cumulative tons (machine age) produced and production rates (machine loading). It was determined that performance can be significantly improved given preventive maintenance programs that will increase machine availability.

PB-256 048/0GA PC$4.50/MF$3.00
Pittsburgh Univ., Pa. School of Engineering.
Feasibility of Considerably Expanded Use of Western Coal by Midwestern and Eastern Utilities in the Period 1978 and Beyond,
John W. Jones, and Thomas A. Paulsen. 7 Nov 75, 61p* FEA/G-76/304
Contract FEA-CO-05-50259-00

Descriptors: *Electric utilities, *Coal utilization, *Economic impact, Coal mining, Transportation, Electric power generation, Economic analysis, Cost comparison, Feasibility, United States, Forecasting.
Identifiers: *Western coal, Eastern Region(United States), Central Region(United States).

This report evaluates the economic impact of western, midwestern and eastern coal competing for the same markets in developing an optimum coal use strategy. A general expansion in the use of surface mined western coal by midwestern and eastern utilities in the period 1978 and beyond is concluded to be economically viable.

PB-256 507/5GA PC$7.75/MF$3.00
Bituminous Coal Research, Inc., Monroeville, Pa.
Design, Fabrication, and Testing of a System to Demonstrate the Effectiveness of Respirable Dust Control on Longwall Shearers by the Use of Water Piped Through the Shearer Drum.
Final rept. May 73-May 76,
Kenneth L. Whitehead, Lee A. Erchard, and Robert D. Saltsman. 21 Jan 76, 211p BCR-L-735, BuMines-OFR-91-76
Contract H0230031

Descriptors: *Dust control, *Coal dust, *Mining equipment, Caving mining, Coal mining, Safety engineering, Design, Performance tests, Drawings, Photographs.
Identifiers: Eickhoff EW-170-L ranging drum shearers.

Control of dust produced by a longwall mining machine is generally accomplished by use of fixed sprays mounted on the machine housing and by sprays mounted on the drum but not directed at the cutting bits. Mounting nozzles on the drum so that each bit is flushed by a jet of water may improve the efficiency of dust suppression. To test this concept, respirable dust measurements were made during 94 regular production shifts on a longwall section, using an Eickhoff Model EW-170-L ranging drum shearer. The equipment used, difficulties encountered, and measurements obtained are described.

PB-256 515/8GA PC$7.75/MF$3.00
PD-NCB Consultants Ltd., London (England).
Research Study of Retreat Surface Area Mining Systems.
Contract research rept.
Mar 76, 216p BuMines-OFR-93-76
Contract J0255003
Prepared in cooperation with Dames and Moore, London (England).

Descriptors: *Surface mining, *Coal mining, *Strip mining, Mining engineering, Land use, Reclamation, Legislation, Regulations, Environmental impacts, Mine haulage, Cost analysis, Cost estimates, Systems analysis, Feasibility.
Identifiers: Retreat mining.

Results of a technical/economic feasibility analysis of conceptual retreat surface area mining systems are presented. The study determined the engineering feasibility, probable costs, and practicality of conceptual retreat area mining systems and compared the conceptual systems with commonly practiced area surface mining techniques. Designs for two retreat mining systems were developed which use haulage schemes laid out so far as to reduce or eliminate the number and maintenance of haul ramps through spoil areas.

PB-256 553/9GA PC$8.00/MF$3.00
Thayer School of Engineering, Hanover, N.H. Dartmouth System Dynamics Group.
A Dynamic Analysis of the Environmental and Social Impacts of Coal Development in the Eastern Powder River Basin of Wyoming, 1960-2010.
Master's thesis,
J. Jay Jacobsen. May 75, 233p DSD-32, NSF/RA/N-75/221

Descriptors: *Coal mining, *Energy policy, *Energy models, *Environmental impacts, Strip mining, Fossil fuels, Electric power plants, Social effect, Economic analysis, Land use, Electric power generation, Coal gasification, Computerized simulation, Computer programs, Powder River Basin, Wyoming, Theses.
Identifiers: *Western coal, National planning and development, Western Region(United States).

As a result of the expressed national goal of reducing oil and gas imports, the U.S. coal industry is trying to increase coal production, in particular by expanding the production of strip-mined coal in western states. In an effort to understand and help resolve the conflict arising from this increase in production, a dynamic regional coal-development model of the Eastern Powder River Basin was constructed. This report presents the model, and uses the model to evaluate several alternative development scenarios for the studied region. The report specifically examines large-scale gasification and electrical-generation development.

PB-256 775/8GA PC$5.50/MF$3.00
Northwestern Univ., Evanston, Ill. Technological Inst.
Heat Extraction from Hot Dry Rock Masses.
Progress rept. 1 Aug 75-31 Jan 76,
J. Weertman, J. D. Achenbach, Z. P. Bazant, J. Dundurs, and L. M. Keer. Apr 76, 125p NSF/RA-760181
Grant NSF-AER75-00187

Descriptors: *Geothermal systems, *Hot-dry-rock systems, *Heat extraction, Rock mechanics, Fracturing, Crack propagation, Fluid flow, Formation pressure, Heat flow, Rock properties, Acoustic properties, Fluid dynamics, Seismic detection, Mathematical models.
Identifiers: Hydraulic fracturing.

Contents:
- Analytic study of crack growth and shape;
- Finite element solution of geothermal energy extraction;
- Fluid flow through cracks;
- Model experiments;
- Seismic detection of hydraulically induced fractures.

PB-256 982/0GA PC$21.25/MF$3.00
Bureau of Mines, Washington, D.C.
Minerals Yearbook, 1973. Volume II. Area Reports: Domestic.
Annual mineral statistics rept.
Aug 76, 817p BuMines-MYB-1973-Vol-2
See also PB-253 655.

Descriptors: *Minerals, *Metals, *Fossil fuels, Statistical data, Mining engineering, Economic geology, Mineral economics, Consumption, Production, Supply(Economics), Demand(Economics), Asphalt, Mineral deposits, Reserves, Mining, Quarrying, Carbon dioxide, Coal, Helium, Natural gas, Crude oil, Peat, United States, Puerto Rico, Canal Zone.
Identifiers: *Minerals Yearbook, *Mineral commodities.

Volume II, Area Reports: Domestic, contains chapters covering the mineral industry of each of the 50 States, the U.S. island possessions in the Pacific Ocean and the Caribbean Sea, the Commonwealth of Puerto Rico, and the Canal Zone. This volume also has a statistical summary chapter.

PB-256 987/9GA PC$8.00/MF$3.00
Hawaii Inst. of Geophysics, Honolulu.
Ferromanganese Deposits of the Ocean Floor. Cruise Report Mn-74-01 R/V MOANA WAVE, Honolulu to San Diego 17 July to 10 August, 1974,
J. E. Andrews, E. Callender, C. J. Bowser, J. L. Mero, and M. Gauthier. 27 Sep 74, 236p HIG-74-9, NSF/IDOE-76-147

Descriptors: *Undersea mineral deposits, *Manganese nodules, *Ferromanganese, *Pacific Ocean, Oceanographic data, Ocean bottom, Diagenesis, Volcanism, Sediments, Sampling, Copper, Nickel, Chemical analysis, Bathymetry.
Identifiers: International Decade of Ocean Exploration.

This program was designed to investigate the origin, growth, and distribution of copper/nickel-rich manganese nodules in the Pacific Ocean. The field effort was designed to satisfy sample requirements of the fifteen principal investigators, while increasing general knowledge of the copper/nickel-rich nodule

deposits of the equatorial Pacific. This report is the first of a series of cruise reports designed to assist sample requests for documented nodules, sediment, and water samples so that laboratory results can be realistically compared and related to the environment of nodule growth.

PB-257 230/3GA PC$7.50/MF$3.00
Cornell Univ. Agricultural Experiment Station, Ithaca, N.Y. Dept. of Agricultural Economics.
Alternative Energy Leasing Strategies and Schedules for the Outer Continental Shelf.
Agricultural economics research rept.,
Robert J. Kalter, Wallace E. Tyner, and Daniel W. Hughes. Dec 75, 196p A. E. Res-75-33, NOAA-76061403
Grant NSF-SIA74-21846

Descriptors: *Leasing, *Offshore operations, *Energy policy, *Government policies, Continental shelves, Petroleum, Alaska, Natural gas, Land acquisition, Planning, Economic analysis, Supply(Economics), Energy models, Economic models.
Identifiers: Outer Continental Shelf.

This report examines the effects of alternative leasing systems and schedules on United States Outer Continental Shelf (OCS) energy development. This summary provides a brief review of both the steps taken in analysis and the results derived. Estimates of the numbers and distribution of undiscovered hydrocarbon fields of various sizes are given. A discussion of alternative leasing systems is presented, and these systems are compared with current U.S. leasing and resources management policy. An analytical framework has been formulated for later use in analyzing alternative leasing strategies and schedules. The potential costs of hydrocarbon exploration are given.

8J. Physical Oceanography

AD-A029 306/1GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
A New Large Volume Filtration System for the Sampling of Oceanic Particulate Matter.
J. K. B. Bishop, and J. M. Edmond. 28 May 75, 19p Rept no. Contrib-9
Contract N00014-75-C-0291
Availability: Pub. in Jnl. of Marine Research, v34 n2 p181-198 1976.

Descriptors: *Sea water, *Particulates, *Filtration, Ocean environments, Concentration(Composition), Volume, Sampling, Particle size, Reprints.

A large volume in situ filtration system has been developed for the extraction of material greater than one micrometer in diameter from several cubic meters of water. The system has worked reliably to 400 meters. The particulate matter concentrations determined in profile compare well with those found using conventional Niskin-Nuclepore techniques. By using 53 micrometer Nitex and 1 micrometers glass fiber filters in series, the samples are separated into two size fractions. Simple calculations show that the large size fraction contributes a significant proportion of the vertical flux of material and that this proportion increases with surface productivity. (Author)

AD-A029 301/9GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
The Origin of Outer Topographic Rises Associated with Trenches,
Research note,
Barry Parsons, and Peter Molnar. 7 Nov 75, 6p
Contract N00014-75-C-0291, Grant NSF-DES-74-03626
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v45 p707-712 1976.

Descriptors: *Ocean bottom topography, *Islands, *Trenching, Oceanography, Bending moments, Gravity, Anomalies, Reprints.
Identifiers: Outer topographic rises.

The outer topographic rise seaward of many island arcs can be explained in terms of a bending moment applied to the oceanic lithosphere either by the downgoing slab to which it is attached or by modest shear stresses acting along the underthrusting plate boundary. The existence of the outer rise does not require large horizontal compressive stresses to maintain it. (Author)

AD-A029 485/2GA PC$7.75/MF$3.00
Coast Guard Washington D C Oceanographic Unit
Oceanographic Observations, North Atlantic Ocean Station Delta, 26 August 1968-26 August 1969.
Oceanographic rept.,
Lawrence J. Hannon. Feb 76, 219p Rept no. USCG-373-69

Descriptors: *Oceanographic data, *North Atlantic Ocean, Temperature, Salinity, Anomalies, Bathythermograph data, Deep water, Oceanographic ships.
Identifiers: DELTA Ocean Station, WHEC 718 vessel.

Oceanographic data from fifteen cruises on Ocean Station DELTA (44 degrees N, 41 degrees W) during the period August 1968 to August 1969 are presented. These data consist of observed and interpolated temperatures and salinities from 257 shallow and 11 deep casts. Analysis of the data on OS DELTA indicates that the North Atlantic Current intrudes on OS DELTA during most of the year. Temperature-salinity (T-S) curves and salinity anomaly analysis are given.

PATENT-3 969 925 Not available NTIS
Department of the Navy Washington D C
In situ Oceanographic Sample Separator.
Patent,
Shale Jack Niskin. Filed 16 Sep 75, patented 20 Jul 76, 7p AD-D002 912/4, PAT-APPL-613 843 Supersedes AD-D001 609.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oceanographic equipment, *Samplers, Sea water, Particles, Fluid filters, Collection, Separation.
Identifiers: PAT-CL-73-61.

A sampler for in situ oceanographic investigation is provided. At any desired depth, water is drawn into the sampler, treated with a desired liquid, and expelled from the sampler by gas pressure. Any particulate matter in the sample is retained on a filter of desired pore size.

PB-256 660/2GA PC$3.50/MF$3.00
Washington Univ., Seattle. Dept. of Oceanography.
Coastal Upwelling Ecosystems Analysis. Technical Report 25. A Shipboard Data Acquisition System for Ecosystem Analysis,
J. C. Kelley, T. E. Whitledge, and R. C. Dugdale. Sep 74, 24p Ref-M74-80, SR-58, NSF/IDOE-76-123

Descriptors: *Shipboard computers, *Data acquisition, *Oceanographic data, Upwelling, Sampling, Data processing.
Identifiers: International Decade of Ocean Exploration, Coastal upwelling ecosystems analysis.

A shipboard data acquisition system has been designed for the analysis of marine ecosystems. The system provides continuous analyses of surface seawater and may operate with the ship underway or holding station. The data are processed by a shipboard computer and are displayed graphically or presented as digital printout. The system provides data acquisition and analysis rapid enough to enable the adaptation of the sampling design of the cruise to the changing nature of the ecosystem.

PB-257 204/8GA PC$4.00/MF$3.00
Virginia Inst. of Marine Science, Gloucester Point.
Detailed Bathymetry of Selected Areas of the Inner Continental Shelf of the Virginian Sea: Southeastern Virginia, Virginia Beach, Virginia; Wachapreague, Virginia.
Special rept.,
Carolyn H. Sutton, Victor Goldsmith, and Asbury H. Sallenger. 1976, 28p VIMS-SRAMSOE-69, NOAA-76061405
Grant NOAA-04-5-158-49
Special rept. no. 69 in Applied Marine Science and Ocean Engineering.

Descriptors: *Bathymetry, Continental shelves, Submarine topography, Ocean environments, Maps, Depth, Ocean bottom, Coastal topographic features, Map projection, Grids(Coordinates), Coastal zone management, North Atlantic Ocean, Virginia, Coasts.
Identifiers: Sea Grant program, Southeast Region(Virginia).

The report includes a series of bathymetric maps containing significantly more information than is commonly included in maps of this kind. The data base grids employed were taken from a portion of the original Transverse Mercator Projection used in the development of the Virginian Sea Wave Climate Model. The areas of the base map selected for compiling the depths used in the second order grids were photographed from the original scribe coat negative and enlarged two times. The third order Virginia Beach Grid was photographed using the same procedure.

8K. Seismology

AD-A029 559/2GA PC$5.50/MF$3.00
Texas Instruments Inc Dallas Equipment Group
Source Studies in the Near- and Far-Field.
Semi-annual technical rept. no. 5 (pt. A), 1 May-30 Nov 75,
Lawrence S. Turnbull, David Sun, James C. Battis, and Frode Ringdal. 30 Nov 75, 106p TI-ALEX(02)-TR-75-02-pt-a, AFOSR-TR-76-1063
Contract F44620-73-C-0055, ARPA Order-1827
See also AD-A029 560.

Descriptors: *Seismic signatures, *Spectrum analyzers, *Earthquakes, Near field, Far field, Dislocations, Faults(Geology), Spectrum analysis, California, China, Earth models.
Identifiers: San Andreas Fault.

Several continuing investigations of the seismic source using near- and far-field data are discussed. The authors completed our analysis of near-field acceleration data recorded at Bear Valley, California, by examining two small events which occurred on 7 February 1974 and 6 July 1974. The February event, using only spectral analysis, was found to have a moment of 3 x 10 to the 21st power dyne-cm with an equivalent circular dislocation radius of 0.18 sq km. Both spectral and time domain waveform fitting techniques were applied to the July event. The solutions using each method were in reasonable agreement, with a seismic moment in the range of 2 to 4 x 10 to the 21st power dyne-cm over an equivalent dislocation radius of about 0.1 to 0.3 sq cm. Using far-field surface wave data, two central California area earthquakes (22 June 1973 and 28 November

1974) were re-examined using two new earth models which were determined by McEvilly (1975) for the northeast and southwest side of the San Andreas fault. Several far-field solutions for the source mechanism were obtained by using various combinations of stations and earth models, including use of both structures at once for the first time. However, for the central California event of 28 November 1974, the mechanism which agreed closely with that obtained by other means used only those stations on the west side of the fault, with the southwest structure used in the spectral fit.

PB-257 258/4GA PC$5.00/MF$3.00
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
A Historical Summary of Earthquake Epicenters in and Near Alaska.
Technical memo.,
Herbert Meyers. Apr 76, 82p NOAA-TM-EDS-NGSDC-1, NOAA-76060108

Descriptors: *Earthquakes, *Seismic epicenter, *Alaska, History, Reviews, Data processing, Tectonics, Seismic waves, Geological faults, Marine geology, Seiches, Tsunamis, Tables(Data), Microfilm, Magnetic tapes, Printouts.

The publication summarizes the Alaska earthquake data file as presently developed by the National Geophysical and Solar-Terrestrial Data Center (NGSDC). This is a growing file and additional data are being added both for current and historical earthquakes as they are prepared for machine processing. It describes data formats, sources used in developing the data file, and data limitations. Included are several tables which summarize the data in usable forms. The publication also is designed to accompany magnetic tapes, microfilm, and printouts produced from the data file.

8L. Snow, Ice, and Permafrost

AD-A029 356/3GA PC$3.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Vanadium and Other Elements in Greenland Ice Cores,
M. M. Herron, C. C. Langway, Jr., H. V. Weiss, J. P. Hurley, and R. J. Kerr. Jul 76, 8p Rept no. CRREL-76-24
Grant NSF-OPP-75-06750

Descriptors: *Vanadium, *Ice, *Trace elements, Chemical analysis, *Aluminum, Manganese, Sodium, Chlorine, Seasonal variations, Greenland.
Identifiers: *Ice cores, Glaciers.

Chemical analysis of surface snows and deeper ice core samples from Milcent, Greenland, indicates a marine origin for Na and Cl and a terrestrial origin for Al, Mn and V. Pre-1900 enrichment factors, based on average crustal composition, are high for Zn and Hg and appear to be related to their volatility. A comparison of pre-1900 and 1971-1973 concentrations of V and Hg shows no decided increase from industrial production; however, the abundance of Zn (relative to Al) increased three-fold during this time period. The chemical composition of ancient ice is extremely useful in interpreting modern aerosols. (Author)

8M. Soil Mechanics

AD-A029 161/7GA PC$9.25/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
The Changeable Interaction between Soils and Pressure Cells; Tests and Reviews at the Waterways Experiment Station.
Final rept.,
Mikael Juul Hvorslev. Jun 76, 284p Rept no. WES-TR-S-76-7
Errata sheet inserted.

Descriptors: *Soil mechanics, *Measuring instruments, Pressure, Hydrostatic pressure, Loads(Forces), Stresses, Interactions, Calibration, Test methods.
Identifiers: *Soil pressure cells.

The principal subjects of the report are the often neglected changes in the interaction of soil and pressure cells with consequent changes in relative errors in cell registrations. The report contains (a) a brief account of the development and use of soil pressure cells; (b) a review of proposed theories for soil-cell interaction; (c) a delayed account of tests with Waterways Experiment Station pressure cells placed in a large triaxial device; and (d) tentative conclusions plus suggestions for calibration, installation, and measuring procedures. Early theories may yield acceptable explanations of the action of soil pressure cells, but corresponding numerical data are not reliable because these theories were based on the Boussinesq equations for forces on the free soil surface, whereas the Mindlin equations should be used for forces acting in the interior of a soil mass. Theory and experiments show lateral stresses may increase or decrease the axial stresses, normal to the faces of a cell, that is, the calibration factor of a soil pressure cell is not a constant but varies with the configuration of the cell, with the magnitude and direction of the principal soil stresses, and with the value of the Poisson ratio in addition to the moduli of deformation of cell and soil. Registration of soil pressure cells may become quite variable and unreliable when the stress conditions in the soil approach those of failure with corresponding changes in soil deformations and properties. (Author)

AD-A029 343/1GA PC$5.00/MF$3.00
Iowa State Univ Ames Engineering Research Inst
Strength and Structure of Laterites and Lateritic Soils.
Final rept. 1 Jul 73-30 Jun 76,
Robert A. Lohnes, Turgut Demirel, and Erdil R. Tuncer. 31 Jul 76, 91p ISU-ERI-AMES-77021, ARO-11831.1-EN
Grant DA-ARO-D-31-124-73-G181

Descriptors: *Soil mechanics, *Laterites, *Basalt, *Soils, Test methods, Thermogravimetric analysis, X ray diffraction, Electron diffraction, Particle size, Shear stresses, Strength(Mechanics), Minerals, Specific gravity, Hawaii, Classification.
Identifiers: Engineering index tests, Mineral content.

Nine soils derived from basalt and five soils derived from volcanic ash, all from Hawaii, were subjected to shear strength tests, engineering index tests, pore size distribution measurements, slaking tests, scanning electron microscopy, x-ray analysis, and thermogravimetric analyses. Relationships are established between the quantitative mineral contents and the engineering behavior of the soils according to the relative degree of weathering that the soils have experienced. These relationships suggest a classification for basalt derived soils based upon the specific gravity of the solids and the void ratio of the soil. No classification system is proposed for ash derived soils but the limited data suggest a system similar to that for the basalt soils might apply. (Author)

PB-257 154/5GA PC$9.25/MF$3.00
Shannon and Wilson, Inc. Agbabian Associates, Seattle, Wash.
In situ Impulse Test, An Experimental and Analytical Evaluation of Data Interpretation Procedures.
Aug 75, 278p NUREG-0028
Contract AT(04-3)-954

Descriptors: *Soil mechanics, *Soil dynamics, Field tests, Nuclear reactor sites, Site surveys, Sands, Dynamic loads, Earthquakes, Earth movements, Nuclear power plants, Washington(State).
Identifiers: *Ground motion, *Earthquake engineering, Fort Lawton, Seattle(Washington).

Special experimental field testing and analytical studies were undertaken at Fort Lawton in Seattle, Washington, to study 'Close-in' wave propagation and evaluate data interpretation procedures for a new in situ impulse test. This test was developed to determine the shear wave velocity and dynamic modulus of soils underlying potential nuclear power plant sites. The test is different from conventional geophysical testing in that the velocity variation with strain is determined for each test. In general, strains between 0.10 and 0.001 percent are achieved. The experimental field work consisted of performing special tests in a large test sand fill to obtain detailed 'close-in' data. Six recording transducers were placed at various points on the energy source, while approximately 37 different transducers were installed within the soil fill, all within 7 feet of the energy source. Velocity measurements were then taken simultaneously under controlled test conditions to study shear wave propagation phenomenology and help evaluate data interpretation procedures.

PB-257 159/4GA PC$5.50/MF$3.00
Purdue Univ., Lafayette, Ind. Joint Highway Research Project.
Improving Embankment Design and Performance: Prediction of As-Compacted Field Strength by Laboratory Simulation.
Interim rept.,
John L. Peterson. Dec 75, 106p JHRP-75-22, FHWA-RD-76-S0513
Prepared in cooperation with Indiana State Highway Commission, Indianapolis.

Descriptors: *Embankments, *Soil properties, *Soil compacting, Soil stabilization, Soil tests, Analysis of variance, Field tests, Indiana.

Three sources of soil compaction data were sought; published works, Indiana State Highway Commission construction files, and field and laboratory data generated by project personnel. The published and construction file data were categorized and statistical analysis of variance and regression techniques were used on suitable sets for evaluation. The expected trends in general were noted; however, due to the statistical characteristics of these data firm conclusions could not be made as to what are the sources of the exhibited variability and behavior of the compacted soil. Field data were obtained by sampling a local highway embankment. From bag samples taken at the fill, laboratory compaction tests were used to generate additional data. The field and laboratory data yielded an encouraging relationship between field and laboratory ascompacted compressive strength for the soil. Molding water content appeared as the dominant factor in the strength prediction model.

PB-257 232/9GA PC$5.50/MF$3.00
Shannon and Wilson, Inc./Agbabian Associates, Seattle, Wash.
Evaluation of Soil Liquefaction Potential for Level Ground During Earthquakes.
Oct 75, 125p NUREG-0026
Contract AT(04-3)-954

Descriptors: *Sands, *Earthquakes, *Soil mechanics, Liquefaction, Pore pressure, Stress cycle, Earth movements, Saturated soils.

Identifiers: *Liquefaction(Soils), Level ground, *Ground motion.

The report evaluates the results of a three-year research program conducted to investigate the settlement and liquefaction of sands under multi-directional shaking. The investigation indicated that the behavior of a saturated sand under cyclic loading conditions is a function of its geologic and seismic history and grain structure as well as its placement density. It is concluded that the resistance to liquefaction of a sand deposit can best be estimated by laboratory testing on undisturbed samples. It is shown that cyclic triaxial tests used in conjunction with appropriate correction factors to account for multi-directional shaking, simple shear loading conditions, and overconsolidation effects can provide valid data on cyclic loading characteristics. The concepts of 'limited strain potential' and acceptable value of the factor of safety against initial liquefaction are introduced in the report. Finally, the two basic methods for evaluating liquefaction potential and the effects of liquefaction are reviewed and updated with the information obtained through this research effort.

PB-257 233/7GA PC$6.75/MF$3.00
Shannon and Wilson, Inc./Agbabian Associates, Seattle, Wash.
Determination of Soil Liquefaction Characteristics by Large-Scale Laboratory Tests.
May 75, 169p NUREG-0027
Contract AT(04-3)-954

Descriptors: *Sands, *Earthquakes, *Soil mechanics, Liquefaction, Pore pressure, Stress cycle, Earth movements, Saturated soils.
Identifiers: *Liquefaction(Soils), *Ground motion.

The testing program described in this report was carried out to study the liquefaction behavior of a clean, uniform, medium sand. Horizontal beds of this sand, 42 inches by 90 inches by 4 inches were prepared by pluviation with a special sand spreader, saturated, and tested in a shaking table system designed for this program, which applied a horizontal cyclic shear stress to the specimens. Specimen size was selected to reduce boundary effects as much as possible. Values of pore pressures and shear strains developed during the tests are presented for sand specimens at relative densities of 54, 68, 82, and 90 percent, and the results interpreted to determine the values of the stress ratio, causing liquefaction at the various relative densities. The study showed that liquefaction of the sand at relative densities greater than approximately 50 percent is a matter of definition of the maximum acceptable shear strain.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A029 163/3GA PC$6.75/MF$3.00
Gaertner (W W) Research Inc Stamford Conn
Development of Failure-Rate Models for Semiconductor Optoelectronic Devices.
Final rept. 1 Mar 75-1 Jul 76,
Donald B. Ellingham, Jr., William M. Schreyer, and Wolfgang W. Gaertner. 1 Jul 76, 174p FAA-RD-76-134
Contract F30602-75-C-0124

Descriptors: *Semiconductor devices, *Optoelectronics, *Failure(Electronics), Light emitting diodes, Couplers, Alphanumeric displays, Germanium, Mathematical models, Mathematical prediction, Specifications, Military requirements.
Identifiers: Failure rates, Optical couplers.

This report describes an effort to establish prediction techniques for the catastrophic failure rate and for the degradation exhibited by optoelectronic devices such as light-emitting diodes (LEDs) alphanumeric displays and optocouplers. The proposed estimation procedures and equations have been developed in a format which is compatible with MIL-HDBK-217B, and Chapters 2 and 4 of this report might be considered for inclusion in an updated version of the handbook. The failure-rate equations are similar to those for germanium diodes in MIL-HDBK-217B, modified to be compatible with all available life-test data on optoelectronic devices. The degradation equations for which no analogy exists in other solid-state devices were formulated from theoretical considerations and matched to available degradation test data. The prediction techniques cover all presently known optoelectronic devices and are expected to remain valid even though the numerical values for the parameters will change as technology matures and more test data are generated.

AD-A029 229/2GA PC$3.50/MF$3.00
Cornell Univ Ithaca N Y School of Applied and Engineering Physics
Performance Factors in rf SQUIDs - High Frequency Limit.
Technical rept.,
R. A. Buhrman, and L. D. Jackel. 17 Aug 76, 5p
Rept no. TR-3
Contract N00014-76-C-0526

Descriptors: *Superconductors, Radiofrequency, Superconductivity, Rings, Bias, Coupling(Interaction).
Identifiers: *Squid devices.

The mode of operation of rf SQUIDs in the limit where the bias frequency Omega exceeds the natural R/L frequency of the SQUID ring is analyzed. Optimum coupling conditions are presented and the intrinsic noise limits are discussed. (Author)

AD-A029 234/2GA PC$4.50/MF$3.00
Hughes Aircraft Co Torrance Calif Electron Dynamics Div
Millimeter Dual Helix Traveling-Wave Tube.
Final rept. 1 Jul 75-30 Jul 76,
A. E. Manoly. Aug 76, 52p EDD-W-06596-F, ECOM-75-1368-F
Contract DAAB07-75-C-1368

Descriptors: *Traveling wave tubes, *Microwave amplifiers, *Power amplifiers, Millimeter waves, Electron guns, Electron beams, Dual mode, Helixes, Ku band, Phase locked systems, Heat sinks, Solenoids, Broaches.

Results of the dual beam electron gun design studies have been incorporated into a reliable production type gun structure. The fixturing produced close tolerances needed for the small gun sizes. The size to length ratio caused severe broaching problems. These problems were solved by fabricating the barrel sections by milling, brazing and final machining. Deformation of the barrel, resulting from the final sizing broach operation, was eliminated by special fixtures. The use of a stripline in conjunction with a two section quarter wave transformer has produced a good match over the band. Two experimental Ku-band traveling-wave tubes have been built and evaluated. The evaluations indicate the limitations of this design. (Author)

AD-A029 247/4GA PC$5.00/MF$3.00
Texas Instruments Inc Dallas Central Research Labs
Progress Report on (Al,Ga)As Devices for Waveguide Circuits.
Technical rept. no. 2, 3 Feb-30 Jun 76,
K. L. Lawley, and J. C. Campbell. Jul 76, 78p
Rept no. TI-08-76-37
Contract N00014-75-C-0501

Descriptors: *Optical waveguides, *Aluminum gallium arsenide, Electrooptics, Lasers, Waveguide couplers, Schottky barrier devices.
Identifiers: Evanescent fields, Dielectric striplines, Rib waveguides.

Work was concentrated on fabrication and characterization of (Al,Ga)As waveguides, developing electrooptic pads on (Al,Ga)As for active waveguide devices, and investigating laser-waveguide coupling by evanescent fields. The waveguide structures investigated have been the dielectric stripline and the rib waveguide. For straight sections of dielectric striplines the authors have measured attenuation losses as low as 5.3 dB/cm, and for rib waveguides, the lowest loss is 8 dB/cm. Additional radiation losses are observed in curved sections of these waveguides. The most significant parameter influencing the bending losses is the thickness of the waveguiding layer. Devices fabricated with very thin (approximately 0.5 micrometers) layers had transmission as high as 60% to 70% around a 90 deg bend having a 120 mil radius of curvature. Smaller radii result in higher loss. In developing electrooptic pads on (Al,Ga)As a problem with interfacial 'oxide' layers between the Schottky barrier contacts and the semiconductor was encountered. These layers are typically an order of magnitude thicker than those on GaAs. A practical solution to this problem appears to be the formation of shallow p-n junctions by Zn diffusions or Be implants. Finally, laser-waveguide coupling by evanescent field coupling was investigated. These devices are fabricated from five- and six-layer structures by selectively etching a laser cavity on top of an underlying passive waveguide. Typically, 10% of the laser power is coupled into the waveguide and emitted into a smaller cone angle suitable for coupling to optical fibers.

AD-A029 264/9GA PC$5.00/MF$3.00
Naval Surface Weapons Center White Oak Lab Silver Spring Md
Linear Integrated Circuit Models and Applications for Computer Aided Circuit and Systems Analysis and Design,
Martin E. Tanenhaus, and Robert L. Martin. 6 Apr 76, 85p Rept no. NSWC/WOL/TR-75-15

Descriptors: *Integrated circuits, *Computer aided design, Operational amplifiers, Phase locked systems, Computerized simulation.

The report describes the development and verification of computer aided network design (CANDE) macro models for an operational amplifier and a phase locked loop. The models were developed using the system elements in the NET-2 Circuit analysis code. The model parameters are obtained directly from the specification sheet. The model verification test programs are described, and the integration of modeling results with a special computerized phase locked loop performed on an integrated circuit tester is presented and discussed. Electronic system modeling is accomplished by developing a model for each functional block of the system separately and then combining all the blocks together to form a complex electronic system.

AD-A029 268/0GA PC$5.50/MF$3.00
Boeing Aerospace Co Seattle Wash
High Voltage Design Guide for Airborne Equipment.
Rept. no. 1, 26 Sep 75-Jun 76 (Final),
William G. Dunbar, and Joseph W. Seabrook. Jun 76, 118p AFAPL-TR-76-41
Contract F33615-76-C-2008

Descriptors: *Electrical insulation, Aircraft equipment, High voltage, Dielectrics, Electric discharges, Electrical corona, Field theory, Quality assurance, Specifications, High power, Electric wire, Electric connectors, Capacitors, Magnetic devices, Test and evaluation.

Identifiers: Design.

The report supplies the theoretical background and design techniques needed by an engineer who is designing electrical insulation for high-voltage high-power components, equipment, and systems on aircraft. A literature survey and abundant bibliography identify references that provide further data on the subjects of partial discharges, corona, field theory and plotting, voids and processes for applying insulation. Both gaseous and solid insulations are treated. Cryogenic and liquid design notes are included. Tests and test equipment for high voltage insulation and equipment are defined. Requirements of test plans and procedures for high-voltage high-power equipment are identified and illustrated by examples. Suggestions for high-voltage specifications are provided. Very few of the Military and Government specifications deal with system voltages above 10kv, thus most aircraft high-voltage specifications will have to be derived from the power industry specifications and standards produced by ASTM, IEEE, and NEMA.

AD-A029 284/7GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Electroabsorption in GaAs and Its Application to Waveguide Detectors and Modulators.
Journal article,
Gregory E. Stillman, Carl O. Bozler, Charles M. Wolfe, and Jon A. Rossi. 28 Jan 76, 4p JA-4571, ESD-TR-76-195
Contract F19628-73-C-0002, ARPA Order-600
Availability: Pub. in Applied Physics Letters, v28 n9 p544-546, 1 May 76.

Descriptors: *Waveguides, *Gallium arsenides, Detectors, Modulators, Electric fields, Schottky barrier devices.
Identifiers: *Electroabsorption, Franz Keldysh effect, Waveguide detectors, Waveguide modulators.

The electroabsorption coefficient of GaAs has been measured in uniform electric fields at wavelengths from 0.91 to 0.93 micrometers. These measurements were made using Schottky barrier contacts on low-loss GaAs waveguides consisting of high-purity epitaxial GaAs grown on heavily doped GaAs substrates. The experimental results are in good agreement with theoretical calculations of the Franz-Keldysh effect. Electroabsorption detectors with subnanosecond response time and 100% internal quantum efficiency have been integrated into these waveguides. Small values of avalanche gain have been obtained without any intentional guard-ring structure. Integrated electroabsorption modulators with greater than 20-dB depth of modulation were also fabricated. (Author)

AD-A029 416/5GA PC$5.50/MF$3.00
Raytheon Co Waltham Mass Research Div
Distributed Ferrite Isolation in Traveling-Wave Tubes.
Final technical rept. Jun 74-May 76,
John M. Osepchuk, and Daniel Masse. Jul 76, 108p Rept no. S-2062
Contract N00014-74-C-0322

Descriptors: *Traveling wave tubes, *Ferrites, *Isolation, *Attenuators, Broadband, L band, Magnetostatics, Helixes, Coupling(Interaction).

This report presents the results of a two year program to demonstrate the feasibility of achieving wideband isolation in high power (approximately 1 KW CW, 2 KW peak) traveling-wave tubes. The program included cold test, analysis and hot test in one experimental tube. In attempting to achieve the widest band possible with TWT's, ferrite designs exploiting the existence of broadband edge modes were sought. This report describes the existence of two branches of such edge modes and evidence of coupling to at least one branch called the magnetostatic wave branch. Though somewhat restricted because of available space in the existing TWT (QKW 1750) the final tube assembly showed the ability to produce over 40 dB reverse loss over an octave band. The designed isolation was wiped out, however, by an unanticipated effect of the axial focussing field in the completed tube. Hot tests showed reasonable beam focussing at above 50-100 percent higher than usual focussing current. No degradation of the samarium-cobalt magnet was observed after tube bakeout (400 C in vacuum). A program to achieve a theoretical understanding of ferrite slab modes and helix ferrite interaction is recommended. The results of such a theoretical study should permit a more successful realization of distributed isolation in TWT's. (Author)

AD-A029 461/1GA PC$4.50/MF$3.00
Watkins-Johnson Co Palo Alto Calif
Final Report on the Switching EBS Development Program.
Rept. for 11 May 73-12 Jun 75.
16 Jan 76, 62p
Contract N00039-73-C-0669

Descriptors: *Electron tubes, *Electronic switches, Electron tube targets, Semiconductor diodes, Electron guns, Modulators, Hybrid systems.
Identifiers: *Electron beam semiconductor devices.

Four types of switching EBS's were developed. The first was a series-connected high voltage switching EBS designed to modulate the grid of TWT's. This device demonstrated up to 1000 V output with a risetime of 18 ns. The second device developed was a single diode high voltage switching EBS with up to 700 V peak output. The single diode design was capable of high output currents and correspondingly fast risetimes; at 700 V output a risetime of 7 ns was measured. The third tube designed and tested for the program was a dual-output 400 V switching EBS which could simultaneously modulate parallel TWTs with no coupling between the two TWTs. The fourth tube designed for the program was an improved version of the dual output-TWT. The size, cost, and weight of the device were significantly reduced while the overall performance of the device was improved.

AD-A029 466/0GA PC$4.00/MF$3.00
Honeywell Inc Golden Valley Minn Ceramics Center
Manufacturing Methods and Techniques for Piezoelectric Transformers.
Quarterly progress rept. no. 3, 14 Jan-14 Apr 76,
William B. Harrison. 27 Aug 76, 42p Rept no. 46548
Contract DAAB07-76-C-0008
See also report dated 14 Jan 76, AD-A025 176.

Descriptors: *Piezoelectric transducers, *Transformers, *Production engineering, Piezoelectric materials, Ceramic materials, Lead compounds, Zirconates, Lead titanates, Image intensifiers(Electronics), Night vision devices, Cost effectiveness, Goggles, Test and evaluation.
Identifiers: Production engineering measures, Lead zirconates.

The report describes the progress and status of the program to establish a cost-effective production capability for 18mm and 25mm piezoelectric ceramic transformers. The results obtained on the first engineering samples are reviewed. Revisions in the design of the 18mm package are described as well as other design changes that have been implemented for the second engineering sample build.

AD-A029 510/5GA PC$5.00/MF$3.00
Texas Instruments Inc Dallas Central Research Labs
Acoustic Ridge Waveguide Technology.
Final technical rept. 6 Jan 75-30 Jun 76,
Robert S. Wagers. Aug 76, 94p Rept no. TI-08-76-41
Contract N00014-75-C-0317, ARPA Order-2827

Descriptors: *Waveguides, *Acoustic equipment, Acoustic waves, Surface waves, Ultrasonics, Etching, Single crystals, Lithium compounds, Niobates, Quartz, Transducers, Filters.
Identifiers: *Acoustic ridge waveguides, Lithium niobates.

The feasibility of etching single-crystal lithium niobate and alpha-quartz to produce wedge-shaped acoustic waveguides has been examined. The primary etchant considered was boiling hydrofluoric acid. Etch masks of sputtered chrome/gold were employed. Highly uniform small (approximately 0.001 inch high) waveguides could be produced in quartz substrates. LiNb03 waveguide fabrication was not possible due to the high defect density in the material. Spurious mode excitation problems were examined and found to be minimal in unapodized transducers on mechanically lapped waveguides with large transverse dimensions. Smaller transverse dimensions or apodization of the transducers introduced interfering modes. Apodization of interdigitated transducers on wedge waveguides was evaluated as a means of achieving bandpass shaping. The entire coupling range was found to be controlled by the first wavelength of apodization. Thus, impulse response weighting by apodization will require control of electrode geometry to within fractions of a wavelength from the apex of the waveguide. (Author)

PAT-APPL-700 279/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Composite for Improved Stripline Board Material.
Patent Application,
Arnold Adicoff , Eugene C. Martin, and Rena L. Lee. Filed 28 Jun 76, 13p AD-D002 888/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Circuit boards, *Glass reinforced plastics, Strip transmission lines, Glass, Microspheres, Ethylene, Styrene plastics, Silanes, Coatings, Dielectrics.
Identifiers: *Patent applications, PAT-CL-260-2.5.

The patent application relates to a stripline board material of hollow glass microspheres chemically bonded to a coating material and physically held in a polymeric matrix, preferably homo- or co-polymers of ethylene, propylene styrene. The coating material is a difunctional silane with one functional group bound to the glass and the other bound either to the matrix or to a copolymer of a structure similar to the structure of the matrix. In the latter case, the sphere-silane-copolyer forms an intimate mixture with the matrix.

PAT-APPL-702 377/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Double-Layer Oxide Gate Insulators for Field-Effect Transistors.
Patent Application,
Wieder H. Herman, and Carl W. Wilmsen. Filed 2 Jul 76, 12p AD-D002 891/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Field effect transistors, *Dielectric films, *Metal oxide semiconductors, Indium phosphides, Anodic coatings, Silicon dioxide,

Deposition, Intermetallic compounds, Compatibility, Group III compounds, Group V compounds.
Identifiers: *Patent applications, PAT-CL-29-371, Group III-V compounds.

The patent application relates to double-layer oxide gate insulators for field effect transistors that are fabricated using gate insulating layers which are compatible with III-V intermetallic compounds. Specifically, indium phosphide is anodized to form the first layer and silicon dioxide is deposited over the first layer to form the second layer.

PATENT-3 958 858 Not available NTIS
Department of the Navy Washington D C
Modified Circuit Card Extender.
Patent,
Robert J. Silveira, Jr. Filed 10 Sep 75, patented 25 May 76, 3p AD-D002 837/3, PAT-APPL-612 111
Supersedes AD-D002 296.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric connectors, *Patents, Printed circuits, Circuit boards.
Identifiers: *Extenders, PAT-CL-339-186.

The patent describes an electronic circuit card extender for providing mechanical as well as electrical interfacing of a printed circuit card or board in an electronic system to its corresponding mating plug on a chassis. The circuit card extender comprises a frame having etching or wiring on one side thereof, to extend the configuration of electrical connections from the circuit card to the corresponding plug on the chassis and a pair of bushings used for keying purposes. Each bushing is mounted on a rotatable shaft which extends along the body of the extender frame to the plug or the chassis connector at one end and has a keying pin at the other end thereof.

PATENT-3 967 224 Not available NTIS
Department of the Navy Washington D C
Coated Magnetically Biased Reed Switch.
Patent,
Robert L. Seeley. Filed 25 Apr 75, patented 29 Jun 76, 4p AD-D002 910/8, PAT-APPL-571 658
Supersedes AD-D002 568.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric switches, *Patents, Proximity devices, Actuators, Magnets, Bioengineering, Implantation, Potting, Epoxy resins.
Identifiers: *Reed switches, PAT-CL-335-151.

The patent relates to a small reed switch having a glass tubularly shaped envelope containing a pair of reed contacts which is modified to ensure its being biased to either an open or a closed position. A donut-shaped piece of a rubber-bonded, barium-ferrite, magnetic material is circumferentially mounted on the reed switch at a position where its magnetic field influences the contacts to an open position or a closed position. Thusly arranged, an actuating magnet, having a sufficient field at a single pre-established distance from the contacts, actuates the switch from all radial directions from the switch. Potting the modified switch in an epoxy resin further ensures a greater reliability and makes it ideal for implantations in laboratory animals.

PATENT-3 968 399 Not available NTIS
Department of the Navy Washington D C
Method for Driving a LED at High Speed.
Patent,
Bobby R. Jarrett. Filed 19 Mar 75, patented 6 Jul 76, 7p AD-D002 911/6, PAT-APPL-559 944
Supersedes AD-D000 664.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Light emitting diodes, *Drives(Electronics), *Patents, Gates(Circuits), Injection diodes, Digital systems, Data rate, Logic devices, Data transmission systems, Optical communications.
Identifiers: Emitter coupled logic, PAT-CL-315-200.

The patent relates to methods of driving a light-emitting diode (LED) or an injection diode at very high digital data rates using high speed emitter coupled logic (ECL) gates.

9B. Computers

AD-A029 131/0GA PC$4.00/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Geometry and Statistics: Problems at the Interface,
Michael Ian Shamos. Jun 76, 32p
Contract N00014-76-C-0370, Grant NSF-MCS75-222-55

Descriptors: *Computations, *Statistical analysis, *Geometry, Algorithms, Nonparametric statistics, Theorems.
Identifiers: Computational complexity.

In this paper the author approaches the analysis of statistics algorithms from a geometric viewpoint and uses techniques from computational geometry to develop new, fast algorithms for computing familiar statistical quantities. Such fundamental procedures as sorting and selection play an important role in nonparametric estimation as well as in correlation and regression and the author uses known results to obtain lower bounds on the time required to perform various statistical tests. For some problems, computing the test statistic is NP-hard. While geometric insight is helpful in understanding statistical calculations, the reverse is also true -- statistical methods are employed to analyze the average case of geometric algorithms.

AD-A029 132/8GA PC$4.50/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Synchronized and Asynchronous Parallel Algorithms for Multiprocessors,
H. T. Kung. Jun 76, 52p
Contract N00014-76-C-0370, Grant NSF-MCS75-222-55

Descriptors: *Multiprocessors, *Parallel processing, *Algorithms, Computations, Synchronism, Asynchronous computers, Statistical analysis, Distribution functions.
Identifiers: Zero finding.

Parallel algorithms for multiprocessors are classified into synchronized and asynchronous algorithms. Important characteristics with respect to the design and analysis of the two types of algorithms are identified and discussed. Several examples of the two types of algorithms are considered in depth.

AD-A029 133/6GA PC$4.00/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
A Fortran Multiple-Precision Arithmetic Package,
Richard Brent. May 76, 33p
Contract N00014-76-C-0370, Grant NSF-MCS75-222-55
Prepared in cooperation with Australian National Univ., Canberra. Computer Centre.

Descriptors: *Floating point operation, *Computer programming, Arithmetic, FORTRAN, Computations, Special functions(Mathematical), Computer programs.

A collection of ANSI Standard FORTRAN subroutines for performing multiple-precision floating-point arithmetic and evaluating elementary and special functions is described. The subroutines are machine-independent and the precision is arbitrary, subject to storage limitations. In this paper the design of the package is discussed, some of the algorithms are described, and test results and an example are given. The complete package is available from the author.

AD-A029 136/9GA PC$4.00/MF$3.00
Defense Mapping Agency Aerospace Center St Louis Air Force Station Mo
Computer Program Optimization,
Annette J. Krygiel. Apr 74, 48p Rept no. DMAAC/TP-74-0001

Descriptors: *Computer programming, *Optimization, Mathematical models, Cost analysis, Compilers, FORTRAN, Management.
Identifiers: *Computer software, UNIVAC-1108 computers, Computer program reliability.

Computer program optimization is a systematic redesign of the mathematical model and/or structure of an operational computer program for purposes of conservation of hardware/manpower resources, improved user satisfaction, better quality of product, and faster response time. While optimization as a mission function within DMAAC/RD was developed in a modified open shop environment, it can be applied in other organizational schematics which meet certain criteria and to computer programs of sufficient import to warrant examination and work. There is a continuing need to examine programs which are major resource users, as well as to scrutinize the integration of important software products with the production process. Optimization satisfies this need. To some degree, it is compatible with the direction given by leaders in the computing milieu to meet the software problems identified in the data processing industry today. In essence, it offers programming management a tool to increase productivity and quality.

AD-A029 175/7GA PC$3.50/MF$3.00
Naval Electronics Lab Center San Diego Calif
The Programmable Algorithm Machine (PAM). Part 1. Theory.
Technical document Jul 75-May 76,
Maniel Vineberg. 4 Jun 76, 21p Rept no. NELC/TD-478-Pt-1
See also Part 2, AD-A028 917.

Descriptors: *Serial processors, *Computer program documentation, Algorithms, *Computer architecture, Subroutines, *Compilers, Theory, High level languages, Assembly languages.
Identifiers: *Programmable algorithm machines, PAM(Programmable Algorithm Machines), *Computer software.

This is Part 1 of a document which describes a Programmable Algorithm Machine (PAM). The proposed architecture includes multiple processing elements, spearate instruction and operand memories, instruction pipelining, and extensibility. The PAM can be programmed in the PAM High-Level Language (PHIL) or in the PAM Assembly Language (PAL). PHIL is an algorithmic programming language; PAL is based upon postfix assignment statements. A single parameterized compiler/assembler

translates PHIL programs into PAL and maps PAL programs on to the PAM. A single parameterized simulation models the PAM family. Suggested applications for the PAM are described in Part 2 (Applications) of this document. (Author)

AD-A029 184/9GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Computation and Mathematics Dept
Pilot Version of Program Internal Documentation Package (PIDOP),
Ray P. Cross, Jesse L. Crusey, and Bernard M. Thomson. Jul 76, 32p Rept no. CMD-14-76

Descriptors: *Computer program documentation, *Computer programs, *Computer programming, Fortran, Subroutines, Computer files, Interfaces, High costs, Data management.
Identifiers: Structured programming.

A package of utility programs, the Program Internal Documentation Package (PIDOP), is being developed to scan compilations of Fortran application programs, record significant associations among subroutines, data entities, and graphics entities, then produce printed reports documenting aspects of the internal structure of the application programs. A pilot version of PIDOP is operational, and instructions for its usage are included. (Author)

AD-A029 202/9GA PC$4.00/MF$3.00
Pattern Analysis and Recognition Corp Rome N Y
The Waveform Processing System. User's Manual for PARLAN (Pattern Analysis and Recognition LANguage).
Final technical rept.,
Thomas L. McGibbon. Jul 76, 46p PAR-76-8-Vol-3, RADC-TR-76-224-Vol-3
Contract F30602-72-C-0193

Descriptors: *Programming languages, *Pattern recognition, Waveforms, Interfaces, Computer programs, Instruction manuals.
Identifiers: *PARLAN programming language, OLWPL programming language.

PARLAN (Pattern Analysis and Recognition LANguage) or the OLWPL (On-Line Waveform Processing Language) has been designed to be very useful in writing programs that involve mathematical computations on waveform and vector data. PARLAN has been specifically developed to operate under the Waveform Processing System and is fully integrated with this system. The effort was funded by RADC Contract F30602-72-C-0193, and represents Volume 3 of the four volume report entitled the Waveform Processing System.

AD-A029 251/6GA PC$5.00/MF$3.00
Charles Stark Draper Lab Inc Cambridge Mass
Intelligence Text and Graphic Editing.
Final technical rept. Apr 75-Apr 76,
Peter D. Wolfe. Jul 76, 79p R-974, RADC-TR-76-205
Contract F30602-75-C-0201

Descriptors: *Television display systems, *Text processing, *Computer programming, Data bases, Interactive graphics, Image processing, Message processing.
Identifiers: *ANAGRAPH system, *Text editing systems, Computer software.

The Anagraph system for which the software described herein was developed consists of a digital television display generator capable of supporting up to 16 users (user terminals consisting of standard television monitors and keyboards), an input device multiplexor, a programmable display controller, and a fixed-head disc for local data base storage. The RADC system is equipped with four of the possible 16 terminals. Optional system hardware is available, including a moving-head disc drive, an IBM-compatible magnetic tape drive, Diablo HyType printer for hard copy output (all of which are part of the RADC system), telecommunications interfaces, and a direct-channel interface to an IBM 360 or 370 computer. In addition to the standard keyboards, terminals may be equipped with extended keyboards which provide an extensive repertoire of programmed function keys, and with trackballs for direct graphical input (one terminal of the RADC system is equipped with a trackball).

AD-A029 283/9GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Hardware Realization of a Fermat Number Transform.
Journal article,
James H. McClellan. 10 Jun 75, 11p JA-4336, ESD-TR-76-190
Contract F19628-73-C-0002
Availability: Pub. in IEEE Transactions on Acoustics, Speech and Signal Processing vASSP-24 n3 Jun 76.

Descriptors: *Fast fourier transforms, *Number theory, Signals, Logic circuits, Reprints.
Identifiers: Pipeline convolvers, *Fermat number transform.

The hardware design and implementation of a Fermat number transform (FNT) is described. The arithmetic logic design is treated in detail and a new data representation for integers modulo a Fermat number is derived. In addition, the FNT is compared with the fast Fourier transform (FFT) on the basis of hardware required for a pipeline convolver. (Author)

AD-A029 312/6GA PC$4.50/MF$3.00
Aerospace Corp El Segundo Calif Information Processing Div
Evaluation of HAL/S Language Compilability Using SAMSO's Compiler Writing System (CWS).
Final rept. Mar 75-Feb 76,
M. Feliciano, H. D. Anderson, and J. W. Bond, III. 20 Aug 76, 70p TR-0076(6803)-1, SAMSO-TR-76-137
Contract F04701-75-C-0076

Descriptors: *Compilers, *Programming languages, *High level languages, *Computer programming, Spacecraft, Space shuttles, Onboard, Computer programs, Computer program documentation, Payload.
Identifiers: HAL/S programming language, Computer software, CDC-6600 computers, Space programming language, *Compiler writing system.

NASA/Langley is engaged in a program to develop an adaptable guidance and control software concept for spacecraft such as shuttle-launched payloads. It is envisioned that this flight software be written in a higher-order language, such as HAL/S, to facilitate changes or additions. To make this adaptable software transferable to various onboard computers, a compiler writing system capability is necessary. A joint program with the Air Force Space and Missile Systems Organization was initiated to determine if the Compiler Writing System (CWS) owned by the Air Force could be utilized for this purpose. The present study explores the feasibility of including the HAL/S language constructs in CWS and the effort required to implement these constructs. This will determine the compilability of HAL/S using CWS and permit NASA/Langley to identify the HAL/S constructs desired for their applications. The study consisted of comparing the implementation of the Space Programming Language using CWS with the requirements for the implementation of HAL/S. It is the conclusion of the study that CWS already contains many of the language features of HAL/S and that it can be expanded for compiling part or all of HAL/S. It is assumed that persons reading and evaluating this report have a basic familiarity with (1) the principles of compiler construction and operation, and (2) the logical structure and applications characteristics of HAL/S and SPL. (Author)

AD-A029 332/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Procurement of ADPE in the Army: An Evaluation.
Study project rept.,
Robert H. Parke. May 76, 35p

Descriptors: *Digital computers, *Army procurement, *Data processing equipment, *Scheduling, Delay, Management, Project personnel, Specifications, Weapon systems, Systems engineering, Management information systems.
Identifiers: Approval process, Milestones, General Services Administration.

The report outlines the administrative approval process imposed by the General Services Administration and the Department of the Army in the procurement of Automatic Data Processing Equipment (ADPE) in order to assess the impact upon the Army project manager. It presents an average delay imposed by the administrative process in order that the project manager can more accurately establish appropriate milestones to prevent project slippage when procurement of ADPE is required for successful project completion. Policy guidance contained in the report was extracted from pertinent General Services Administration, Department of Defense and Department of the Army Regulations. A survey of the project files maintained by US Army Computer Systems Support and Evaluation Agency (USACSSEA), the Army ADPE procurement activity reveals that the project manager can expect a 65 week minimum delay from the time the requirement has been received at USACSSEA until the time the contract is awarded. Failure on the part of the project manager to consider this delay in project scheduling could seriously jeopardize project completion. (Author)

AD-A029 363/9GA PC$6.75/MF$3.00
Auerbach Associates Inc Philadelphia Pa
Developmental Support of the Scientific and Technical Intelligence System.
Final technical rept. Jun 75-Apr 76,
Jerome Sable. Jun 76, 156p RADC-TR-76-197
Contract F30602-75-C-0273

Descriptors: *Military intelligence, *Data processing, *Information retrieval, *Data management, Coding, Interfaces, Nodes, Computer files, Computer architecture, Digital computers.
Identifiers: *Intelligence data handling systems, Subsystems, IDHS(Intelligence Data Handling Systems), Information systems.

This project has provided technical assistance to the development team of the Scientific and Technical Intelligence System (STIS) at Air Force Foreign Technology Division (FTD). The effort was directed at the design and documentation of several data structures and programmed capabilities of STIS. These included the following: (1) An Indexed-Sequential Access Method and Directory for encoding and decoding STIS user and system terms. (2) the data structure of a generalized STIS node which can serve for the elements of the STIS Concept Net, including entities, semantic elements (attributes and values), and derivation rules, and (3) a set of interpretations of the node structure and the definition of an approach which can be used by the analyst in representing intelligence information in the Concept Net,

including source information, credibility, events, states, transitions, and general deductive rules. (Author)

AD-A029 376/1GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Life Cycle Guidelines for Weapon System Software Management.
Student project rept.,
Harry E. Pontius. May 76, 59p

Descriptors: *Computer program documentation, *Computer programs, *Management planning and control, Life cycles, Weapon systems, Electronic warfare, Tactical air control systems, Digital computers.
Identifiers: *Computer software.

The purpose of the project is to explore the relationship of the computer software subsystem to the overall system undergoing acquisition. A brief history of digital computers in weapons system is presented and current DOD and Air Force management policies are presented. The development approach of four Air Force Programs is discussed and selected life cycle development and maintenance guidelines are discussed. Numerous recommendations for use by the Program/System Manager in managing a software development effort are identified for selective application. A large bibliography of thirty-nine readings is presented on the subject. (Author)

AD-A029 395/1GA PC$4.50/MF$3.00
Pattern Analysis and Recognition Corp Rome N Y
Application of Pattern Analysis and Recognition to I and W.
Final technical rept. Mar 75-Jan 76,
Christopher Landauer, John Morris, Clinton Mah, John Sanders, and Frank Blackburn. Jul 76, 68p PAR-76-3, RADC-TR-76-226
Contract F30602-75-C-0157
See also Rept. no. PAR-75-10 dated Aug 75, AD-A016 436.

Descriptors: *Pattern recognition, *Message processing, Military intelligence, Information retrieval, Management information systems, Algorithms, Data bases, Clustering, Associative processing, Linguistics.
Identifiers: Message extraction through estimated relevance system, METER system, Keywords.

The goal of the initial three-month feasibility study reported here has been the design and testing of critical components of the Message Extraction Through Estimated Relevance (METER) System. Description of the designs and tests are included in this report. In addition, background materials concerning the goals of the project are presented, together with a description of associative methods for document analysis and classification. Finally, a theoretical discussion introduces questions for which additional research will be required. Reference is made to the RADC Automatic Document Classification On-Line (RADCOL) system, which furnished initial designs for METER components. An evaluation of the RADCOL system is provided in RADC-TR-75-208. (Author)

AD-A029 413/2GA PC$9.00/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
DVT Diagnostic System.
Technical note,
Richard I. Tucker, and Maurice Daniel. 19 Jul 76, 272p TN-1976-4, ESD-TR-76-214
Contract F19628-76-C-0002

Descriptors: *Data processing terminals, *Diagnostic equipment, *Computer programs, Voice communications, Digital computers, Subroutines, Assemblers, Memory devices, Errors, Arithmetic units.
Identifiers: *Digital voice terminals, UNIVAC-1219 computers, PDP-11 computers, Host computers, PROM exerciser computer program.

A diagnostic system for the Lincoln Digital Voice Terminal (LDVT) is described. The LDVT's diagnostic system consists of a series of programs to check the operation of all hardware as well as control programs for either the UNIVAC-1219 or PDP-11 computer serving as host. A self-contained diagnostic exerciser is also described. All fault condition codes are tabulated for easy deciphering. (Author)

AD-A029 446/2GA PC$3.50/MF$3.00
Defense Communications Engineering Center Reston Va
SOL-370 Installation and Error Tracing Guide.
Technical note,
H. Ulfers. Aug 76, 19p Rept no. TN-23-76

Descriptors: *Computer programming, *Computerized simulation, Errors, Debugging(Computers), Computer programs, Instruction manuals.
Identifiers: PL/1 programming language, SOL-370 system.

This report contains instructions for detection and tracing of errors which occur during execution of simulation models implemented with the SOL-370 Simulation System. It also gives instructions for the installation and initial testing of the system.

AD-A029 484/3GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md
GEOCES: A Gaussian Elimination Out-of-Core Equation Solver,
Donald A. Gignac. Jun 76, 26p Rept no. DTNSRDC-76-0096

Descriptors: *Matrices(Mathematics), *Finite element analysis, *Computer aided design, *Shipbuilding, *Subroutines, Structural analysis, Computer programs, Core storage, Limitations, Random access computer storage.
Identifiers: Gaussian elimination, Out of core solution, GEOCES computer program, FORTRAN.

In the finite element approach to structural analysis the solution of the equation KU = P is basic. K is usually a banded matrix which is symmetric and positive definite. However in certain areas such as fluid-structures interaction problems K may be a non-symmetric banded matrix. Further the order of K is often so large that, even when the banded structure of K is taken into account, the storage of K in the core memory of a computer may not be feasible or even possible. GEOCES is a Gaussian elimination out-of-core equation solver for non-symmetric banded systems of linear equations. GEOCES should be regarded as experimental rather than as a production program. GEOCES is written in FORTRAN Extended for the CDC 6000 series of computers with respect to the SCOPE 3.4 operating system and assumes the availability of random access scratch files. (Author)

AD-A029 520/4GA
Mag Tape $150.00;Foreign $190.00
Army Audit Agency Falls Church Va
Army Uniform Data Inquiry Technique (AUDIT).
Software,
Edwin Rappe. 1 May 76, Mag tape DOD/DF-76/007
Supersedes AD-777 100. Price includes documentation, AD-A029 521, AD-A029 522, AD-A029 523.

Source tape is in EBCDIC character set. Tape(s) can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. (No copies furnished by DDC).

Descriptors: *Computer programs, *Management information systems, *Auditing, Army operations, Compilers, Boolean algebra, Scheduling, Magnetic tape.
Identifiers: *Software, *AUDIT system, COBOL, IBM-360/370 computers.

AUDIT is a data retrieval system which features a user oriented specification language and precompiler which generates COBOL source programs for compilation and execution in a batch processing environment. Capabilities of AUDIT include: high level user language, field editing, algebraic computation, Boolean selection logic, random sample extraction, statistical analysis of data fields, sorting, report generation, extract file generation, multiple extraction/reporting per file pass. Source programs and JCL are for IBM 360 OS or DOS configurations however the system has been converted by other uses for operation on the Univac 494, Univac Series 70/45, Univac 1108 and Honeywell 6050. Included on the tape are the necessary COBOL programs (4) which comprise AUDIT...Software Description: This program is written in the COBOL programming language for implementation on IBM 360/370 computer with either the OS or DOS operating system. The program requires 100K bytes of core storage for implementation.

AD-A029 521/2GA PC$4.50/MF$3.00
Army Audit Agency Falls Church Va
Army Uniform Data Inquiry Technique (AUDIT). User's Manual.
31 Jan 76, 62p DOD/DF-76/007a, , USACSC-Manual-18-1-B-AVB-Vol-2
For system on magnetic tape, see AD-A029 520. See also AD-A029 522 and AD-A029 523. Supersedes report dated Mar 74, AD-777 101.

Descriptors: *Computer programming, *Management information systems, *Auditing, Army operations, Instruction manuals, Boolean algebra, Statistical analysis, Computations.
Identifiers: *AUDIT systems, COBOL, IBM-360 computers, UNIVAC-494 computers, UNIVAC-70/45 computers, UNIVAC-1108 computers, Honeywell-6050 computers.

AUDIT is a data retrieval system which features a user oriented specification language and precompiler which generates COBOL source programs for compilation and execution in a batch processing environment. Capabilities of AUDIT include: high level user language, field editing, algebraic computation, Boolean selection logic, random sample extraction, statistical analysis of data fields, sorting, report generation, extract file generation, multiple extraction/reporting per file pass. Source programs and JCL are for IBM 360 OS or DOS configurations however the system has been converted by other uses for operation on the Univac 494, Univac Series 70/45, Univac 1108 and Honeywell 6050. The AUDIT USER Manual serves as the primary reference for users of the system.

AD-A029 522/0GA PC$4.00/MF$3.00
Army Audit Agency Falls Church Va
Army Uniform Data Inquiry Technique (AUDIT). DOS Operations and Scheduling Manual.
31 Jan 76, 30p DOD/DF-76/007b, , USACSC-Manual-18-1-B-AVB-vol-3-dos
For system on magnetic tape, see AD-A029 520. See also User's Manual, AD-A029 521, and AD-A029 523. Supersedes AD-777 102.

Descriptors: *Computer programming, *Management information systems, *Auditing, Army operations, Scheduling, Instruction manuals.
Identifiers: *AUDIT system, COBOL.

AUDIT is a data retrieval system which features a user oriented specification language and precompiler which generates COBOL source programs for compilation and execution on a batch processing environment. Capabilities of AUDIT include: high level user language, field editing, algebraic computation, Boolean selection logic, random sample extraction, statistical analysis of data fields, sorting, report generation, extract file generation, multiple extraction/reporting per file pass. Source programs and JCL are for IBM 360 OS or DOS configurations however the system has been converted by other uses for operation on the Univac 494, Univac Series 70/45, Univac 1108 and Honeywell 6050. The AUDIT OPERATION Manual serves as the primary reference for scheduling and operation of the system.

AD-A029 523/8GA PC$4.00/MF$3.00
Army Audit Agency Falls Church Va
Army Uniform Data Inquiry Technique (AUDIT). OS Operations and Scheduling Manual.
31 Jan 76, 33p DOD/DF-76/007c, , USACSC-Manual-18-1-B-AVB-vol-3-os
For system on magnetic tape, see AD-A029 520. See also User's Manual, AD-A029 521.

Descriptors: *Computer programming, *Management information systems, *Auditing, Army operations, Scheduling, Boolean algebra, Computations, Instruction manuals.
Identifiers: *AUDIT system, COBOL.

AUDIT is a data retrieval system which features a user oriented specification language and precompiler which generates COBOL source programs for compilation and execution in a batch processing environment. Capabilities of AUDIT include: high level user language, field editing, algebraic computation, Boolean selection logic, random sample extraction, statistical analysis of data fields, sorting, report generation, extract file generation, multiple extraction/reporting per file pass. Source programs and JCL are for IBM 360 OS or DOS configurations however the system has been converted by other uses for operation on the Univac 494, Univac Series 70/45, Univac 1108 and Honeywell 6050. The AUDIT OPERATION Manual serves as the primary reference for scheduling and operation of the system.

AD-A029 549/3GA PC$7.75/MF$3.00
Ohio State Univ Columbus Electroscience Lab
Comparative Evaluation of the Subsystem and Nearest-Neighbor Classifiers for Radar Aircraft Identification.
Interim rept.,
S. N. Srihari. Jun 76, 213p ESL-3815-3, AFOSR-TR-76-0931
Grant AF-AFOSR-2611-74

Descriptors: *Pattern recognition, *Radar targets, IFF systems, Classification, Algorithms, Identification systems, Computer programs, Probability, Decision theory.
Identifiers: Nearest neighbor rules, Bayes classifiers, Sebestyen classifiers.

The purpose of this report is to investigate aspects of design and evaluation of classification algorithms for a type of pattern recognition problem. The problem is one that is encountered in the design of a radar aircraft identification system. This problem differs from the usual situation encountered in statistical pattern recognition theory. Here classes are characterized by labelled training patterns that are considered to be ideal. The test pattern is assumed to be a noisy version of one of the ideal patterns, where noise is generated by a statistical process. The situation where noise perturbation is Gaussian is considered in detail. The Bayes classifier in this case has the form of the Sebestyen classifier. Techniques for efficient computer implementation, and evaluation of the Sebestyen classifier are investigated. A relationship between the Sebestyen classifier and a nearest-neighbor classifier that utilizes the ideal patterns as its reference set is obtained. Conditions for identity of decision surfaces of the two classifiers are shown. These conditions are on the location of reference patterns in feature-space.

AD-A029 631/9GA PC$16.25/MF$3.00
Stanford Research Inst Menlo Park Calif
Symposium on Advanced Memory Concepts.
Final rept.,
Stephen W. Miller, and Ugo O. Gagliardi. Jun 76, 675p
Contract N00014-76-C-0371

Descriptors: *Memory devices, *Computer architecture, Information retrieval, *Data storage systems, Symposia, Computer graphics, Real time, Mass storage, Bubble memories, Optical storage, Holography, Charge coupled devices, Data management, Magnetic recording systems.
Identifiers: Advanced planning, AMC program.

Early in FY 1975, in response to projected DoD needs, the Information Processing Technology Office of the Advanced Research Projects Agency (ARPA) initiated work on the Advanced Memory Concepts (AMC) program which addresses hardware aspects of the memory technology problem. The objectives of the AMC program are to investigate, characterize, and develop as appropriate the fundamental physical concepts that contribute to the efficient storage and retrieval of information, as well as the concomitant computer architecture and organization required to realize the best advantages of the new concepts in the 1985-95 time period. As a part of the AMC program, a workshop (or symposium) was conducted during March 1976 to articulate a concerted series of recommended research directions for inclusion in the AMC program.

AD-A029 664/0GA PC$4.50/MF$3.00
Softech Inc Waltham Mass
An Exploratory Study of Reasons for HOL Object Code Inefficiency.
Final rept. Mar-May 76,
John B. Goodenough. Aug 76, 64p 1021-11.1, ECOM-75-0373-F
Contract DAAB07-75-C-0373

Descriptors: *High level languages, *Programming languages, *Computer programming, *Military tactics, Computer program documentation, Computer programs, Real time, Compilers, Machine coding, Optimization, Tactical warfare, Programmers.
Identifiers: High order languages, Computer software, Structured programming, Jovial programming language.

This report describes an exploratory study of some executive and tactical programs written in a high order language. The objective of the study was to determine the extent to which object code inefficiencies are affected by the design of a programming language, a compiler's optimization strategies, and how the language is used (programming style). Specific examples of program segments are analyzed together with object code produced by a compiler for a specific military computer. The most significant finding is that in tactical programming, at least, source code readability and maintainability are strongly affected by a compiler's optimization strategies when object code efficiency is important, and consequently, the effect of these strategies on programming style needs to be given much more careful attention than is currently the case. (Author)

FIPS-PUB-0 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: General Description of the Federal Information Processing Standards Register.
Federal information processing standards pub.
1 Nov 68, 11p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards.
Identifiers: *Federal information processing standards.

The publications in this series are used to announce and maintain Federal Information Processing Standards. Also, these publications are issued to provide standards information of a general interest and a complete index of relevant standards publications and specifications.

FIPS-PUB-1 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Code for Information Interchange. Hardware Standard Interchange Codes and Media.
Federal information processing standards pub.
1 Nov 68, 20p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Data processing equipment, Communication equipment, Character processors, Coding.
Identifiers: *Federal information processing standards.

This USA Standard presents the standard coded character set to be used for information interchange among information processing systems, communication systems, and associated equipment. Other standards will prescribe the means of implementing this standard in media, such as perforated tape, magnetic tape, and punched cards. Further standards will deal with error control, data communication formats, keyboards, graphic representation of control characters, and code extension considerations. The 7-bit coded character set was developed from a careful review of past work in the field, and, after a comprehensive program of original research and code design, was completed. Careful consideration has been given to the several conflicting code set requirements, and their resolution is reflected in the standard code.

FIPS-PUB-10-1 PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Countries, Dependencies, and Areas of Special Sovereignty. Federal General Data Standard Representations and Codes.
Federal information processing standards pub.
15 Jun 74, 41p
Supersedes FIPS-PUB-10, PB-194 345. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Identifying, Coding.

Identifiers: *Federal information processing standards, *Countries.

This publication provides a list of geographical-political entities of the world and associated standard codes. These entities include independent states, dependent areas, areas of quasi-independence, noncontiguous territories, possessions without population, areas with special sovereignty associations, areas without sovereignty, political regimes not recognized by the United States, and outlying areas of the United States.

FIPS-PUB-11 PC$6.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Vocabulary for Information Processing. Category: Software. Subcategory: Documentation.
Federal information processing standards pub. 1 Dec 70, 134p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Words(Language), Computer programming, Terminology, Dictionaries.
Identifiers: *Federal information processing standards, *Vocabulary.

This publication provides an alphabetic listing of approximately 1200 entries, each consisting of a term and its definition, for use in information processing activities such as the description, representation, communication, interpretation, and processing of data by human or automatic means. Multiple-word terms are listed in their natural order; terms with identical last words appear as 'See references' under the common word. Other reference symbols indicate synonyms, preferred terms, contrasting meanings, and unabbreviated forms for defined terms which are acronyms or abbreviations.

FIPS-PUB-12-2 PC$7.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Federal Information Processing Standards Index.
Federal information processing standards pub. 1 Dec 74, 198p
Supersedes FIPS-PUB-12-1, COM-75-50111.
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Indexes(Documentation), Data processing security, Coding, Programming languages, Data transmission, Telecommunication.
Identifiers: *Federal information processing standards.

This publication provides material concerning standardization activities in the area of information processing at the Federal, National, and International levels. Also included are related policy and procedural guideline documents. A list of Federal Government participants involved in the development of Federal Information Processing Standards is provided. This FIPS PUB is revised and updated annually.

FIPS-PUB-13 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Rectangular Holes in Twelve-Row Punched Cards. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 1 Oct 71, 16p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Punched cards, Specifications.
Identifiers: *Federal information processing standards.

This publication provides information on the size, location and dimensional tolerances of rectangular holes in 12-row, 3 1/4 inch wide punched cards. It applies to card reading and punching equipment used in data processing, communications and similar operations in the Federal government. This Federal standard adopts in whole a revised version of American National Standard X3.21-1967, Rectangular Holes in 12-Row Punched Cards.

FIPS-PUB-14 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Hollerith Punched Card Code. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 1 Oct 71, 22p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Hollerith code, Punched cards, Specifications.
Identifiers: *Federal information processing standards.

This publication provides a standard set of 128 hole patterns which represent the 128 characters of the Federal Standard Code for Information Interchange (ASCII) FIPS 1, in 12-row, 80 column, rectangular hole, 'Hollerith' punched cards, or the subsets of ASCII as specified in FIPS 15, Subsets of the Standard Code for Information Interchange. It adopts one-half of the 256 hole patterns given in the American National Standard X3.26-1969, Hollerith Punched Card Code.

FIPS-PUB-15 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Subsets of the Standard Code for Information Interchange. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 1 Oct 71, 15p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Symbols, Graphic arts, Punched card equipment, Printers(Data processing), Display devices, Coding.
Identifiers: *Federal information processing standards.

This publication provides three subsets of 95, 64 and 16 graphic characters derived from the Federal Standard Code for Information Interchange (FIPS 1), which was adopted from the American Standard Code for Information Interchange (ASCII) X3.4-1968. These subsets are for use in Federal printers, display devices, punched card equipment, and other data processing or communication equipments which use a character subset less than the full 128-character set of FIPS 1.

FIPS-PUB-16 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Bit Sequencing of the Code for Information Interchange in Serial-By-Bit Data Transmission. Category: Hardware Standard. Subcategory: Transmission.
1 Oct 71, 16p
Previously announced as COM-71-50417. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data transmission, *Binary digits.
Identifiers: *Federal information processing standards.

This publication prescribes the method for transmitting the American Standard Code for Information Interchange (ASCII) in systems employing serial-by-bit, serial-by-character data transmission. The least significant bit (b1) is transmitted first, the most significant bit (b7) last, followed by the character parity bit (if transmitted).

FIPS-PUB-17 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Character Structure and Character Parity Sense for Serial-By-Bit Data Communication in the Code for Information Interchange. Category: Hardware Standard. Subcategory: Transmission.
1 Oct 71, 15p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data transmission.
Identifiers: *Federal information processing standards.

This publication specifies the character structure and character parity sense for transmitting the American Standard Code for Information Interchange (ASCII) in systems employing serial-by-bit data transmission. Characters are to be transmitted as eight bits (seven ASCII bits plus one character parity bit). The parity sense shall be odd for synchronous transmissions and even for asynchronous transmissions.

FIPS-PUB-18 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Character Structure and Character Parity Sense for Parallel-By-Bit Data Communication in the Code for Information Interchange. Category: Hardware Standard. Subcategory: Transmission.
Federal information processing standards pub. 1 Oct 71, 14p
Previously announced as COM-71-50419. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data transmission, *Character processors.
Identifiers: *Federal information processing standards.

This publication specifies the character structure and character parity sense for transmitting the American Standard Code for Information Interchange (ASCII) in systems employing parallel-by-bit data transmission. The seven ASCII bits (b1 through b7) plus the character parity bit (P) are assigned to an ordered series of channel designators. The most significant bit (b1) is assigned to the lowest designator and (P) to the highest designator.

FIPS-PUB-19 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines for Registering Data Codes. Federal General Data Standard Representations and Codes.
Federal information processing standards pub. 1 Feb 72, 12p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Coding, Abbreviations, Numbering systems.
Identifiers: *Federal information processing standards, *Data codes, *Data elements.

Office of Management and Budget Circular No. A-86, Standardization of data elements and codes assigns to the National Bureau of Standards responsibility for maintaining registers of data elements and codes and to Federal departments and agencies the responsibility for registering program and agency codes with NBS. This publication provides guidelines for registering data codes with NBS and for reporting the use of the codes to maintaining agencies for purposes of receiving changes.

FIPS-PUB-2 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Perforated Tape Code for Information Interchange. Hardware Standard Interchange Codes and Media.
Federal information processing standards pub. 1 Nov 68, 14p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Punched tapes, Data processing equipment, Communication equipment, Office machines.
Identifiers: *Federal information processing standards.

This publication represents the standard method of recording the USA Standard Code for Information Interchange, X3.4-1963 in perforated tape. It is one of a series of standards relating to information interchange among information processing systems, communication systems and associated equipment. Other standards will specify the physical, chemical and optical characteristics of the tape. Related standards will deal with machine tool and process control. The arrangement of the 7 bits in hole tracks was developed by a group of highly qualified and experienced specialists in the use of perforated tape in information processing and communication.

FIPS-PUB-20 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines for Describing Information Interchange Formats. Category: Software. Subcategory: Documentation.
Federal information processing standards pub. 1 Mar 72, 15p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Specifications.
Identifiers: *Federal information processing standards, *Formatted file systems.

This publication provides guidelines which identify and describe the various characteristics of formatted information that should be considered whenever formatted information is interchanged. The objective is to clarify and improve the documentation necessary to effectively provide, process, or use the information involved. The guidelines provided are to be used throughout the Federal Government as a checklist for preparing effective documentation of formatted information interchange.

FIPS-PUB-21-1 PC$13.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: COBOL.
Federal information processing standards pub. 1 Dec 75, 555p
Supersedes FIPS-PUB-21, PB-246 438. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *COBOL, Compilers, Programming manuals.
Identifiers: *Federal information processing standards.

This FIPS PUB announces the adoption of the American National Standard COBOL (X3.23-1974) as the Federal Standard COBOL. This revision supersedes FIPS PUB 21 and reflects major changes and improvements to the COBOL specifications. The American National Standard defines the elements of the COBOL Programming Language and the rules for their use. The standard is used by implementors as the reference authority in developing compilers and by users for writing programs in COBOL. The primary purpose of the standard is to promote a high degree of interchangeability of programs for use on a variety of automatic data processing systems. The COBOL language is intended for use in computer applications that emphasize the manipulation of characters, records, and files.

FIPS-PUB-22 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Synchronous Signaling Rates Between Data Terminal and Data Communication Equipment. Category: Hardware Standards. Subcategory: Transmission.
Federal information processing standards pub. 1 Nov 72, 16p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data transmission, *Synchronism.
Identifiers: *Federal information processing standards.

This publication prescribes speeds for transferring binary encoded information in synchronous serial or parallel forms between data terminal and data communication equipments employing voice band communication facilities. Speeds ranging from 75 to 9600 bits-per-second are specified.

FIPS-PUB-23 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Objectives and Requirements of the Federal Information Processing Standards Program.
Federal information processing standards pub. 15 Feb 73, 12p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Objectives, *Legislation.
Identifiers: *Federal information processing standards.

Public Law 89-306 (the Brooks legislation) was enacted to provide for the economic and efficient purchase, lease, maintenance, operation and utilization of automatic data processing equipment by Federal departments and agencies. Among the other provisions of PL 89-306, the Secretary of Commerce is authorized to make appropriate recommendations to the President relating to the establishment of uniform Federal automatic data processing standards. The Federal Information Processing Standards Program was established in response to this part of the legislation. The purpose of this document is to outline the objectives of the Federal Information Processing Standards Program and to identify requirements for specific standards necessary to accomplish these objectives.

FIPS-PUB-24 PC$4.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Flowchart Symbols and Their Usage in Information Processing. Category: Software. Subcategory: Documentation.
Federal information processing standards pub. 30 Jun 73, 26p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Symbols, *Flow charting, Computer programming.
Identifiers: *Federal information processing standards.

This publication establishes standard flowchart symbols and specifies their use in the preparation of flowcharts in documenting information processing systems. This standard applies to any Federal information processing operation where symbolic representation is desirable to document the sequence of operations and the flow of data and paperwork.

FIPS-PUB-25 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Recorded Magnetic Tape for Information Interchange (1600 CPI, Phase Encoded). Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 30 Jun 73, 21p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Magnetic tapes, Magnetic recording, Tape recording, Specifications.
Identifiers: *Federal information processing standards.

This standard specifies the recorded characteristics of 9-track, one-half inch wide magnetic computer tape, including the data format for implementing the Federal Standard Code for Information Interchange at the recording density of 1600 characters per inch (CPI). It is one of a series of Federal Standards implementing the Federal Standard Code for Information Interchange (FIPS 1) on magnetic tape media.

FIPS-PUB-26 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: One-Inch Perforated Paper Tape for Information Interchange. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 30 Jun 73, 16p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-75, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Punched tapes, Specifications.
Identifiers: *Federal information processing standards.

This standard specifies the physical dimensions and tolerances of one-inch wide paper tape, including the size and location of the perforations used for recording information.

FIPS-PUB-27 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Take-Up Reels for One-Inch Perforated Tape for Information Interchange. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 30 Jun 73, 19p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Punched tapes.
Identifiers: *Federal information processing standards, *Reels.

This standard specifies the physical dimensions of paper tape take-up (or storage) reels, with either fixed or separate flanges. The two types of reels specified differ in the size and shape of the drive hub, but both are intended for use with one-inch perforated paper tape devices.

FIPS-PUB-28 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Standardization of Data Elements and Representations.
Federal information processing standards pub. 5 Dec 73, 17p
Previously announced as COM-74-50311. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards.
Identifiers: *Federal information processing standards, *Data elements.

Pursuant to the authority delegated to the Secretary of Commerce by Executive Order 11717 (38 FR 12315, dated May 11, 1973), Subtitle A of Title 15 of the Code of Federal Regulations has been amended to add a new Part 6 which implements the provisions of Section III (f) (2) of the Federal Property and Administrative Services Act of 1949, as amended (79 Stat. 1127). This new Part 6 supersedes and replaces in its entirety the provision of Office of Management and Budget Circular A-86 entitled, 'Standardization of data elements and codes in data systems,' dated September 30, 1967 which was rescinded by the Director of the Office of Management and Budget on August 29, 1973. Part 6 provides policy and identifies responsibilities of executive branch departments and independent agencies for a government-wide program for the standardization of data elements and representations used in Federal automated data systems. This publication provides a copy of Part 6 and other documents relating to this amendment.

FIPS-PUB-29 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Interpretation Procedures for Federal Standard COBOL.
Federal information processing standards pub. 30 Jun 74, 6p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Compilers, Computer programming.
Identifiers: *Federal information processing standards, *COBOL.

This FIPS PUB defines the procedures that will be followed in requesting interpretations of the Federal Standard COBOL and in providing responses to those requests. The provisions of this document apply to all Federal departments and agencies and to vendors of COBOL compilers in their dealings with the Federal Government.

FIPS-PUB-3-1 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Recorded Magnetic Tape for Information Interchange (800 CPI, NRZI). Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 30 Jun 73, 21p
Supersedes FIPS-PUB-3. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Magnetic tapes, Magnetic recording, Tape recording.
Identifiers: *Federal information processing standards.

This standard specifies the recorded characteristics of 9-track, one-half inch wide magnetic computer tape, including the data format for implementing the Federal Standard Code for Information Interchange at the recording density of 800 characters per inch (CPI). It is one of a series of Federal Standards implementing the Federal Standard Code for Information Interchange (FIPS 1) on magnetic tape media. This revision to FIPS PUB 3 reflects a change in scope from the earlier version of X3.22-1967, and encompasses the recorded tape requirements only. The unrecorded tape standard will include the requirements for the physical properties of the tape and reels that were previously included in FIPS 3.

FIPS-PUB-30 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Software Summary for Describing Computer Programs and Automated Data Systems. Category: Software. Subcategory: Documentation.
Federal information processing standards pub. 30 Jun 74, 9p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Computer programming.
Identifiers: *Federal information processing standards, *Computer software.

This publication provides a standard software summary form (SF-185) together with instructions for describing computer programs and/or automated data systems for identification, reference, and dissemination purposes. Federal Information Processing Standard Software Summary Form (SF-185) will be used in documenting summaries or abstracts of programs and/or automated data systems that are developed or acquired by Federal departments and agencies. This form will also be used by the General Services Administration in the establishment of a centralized registry of selected government software.

FIPS-PUB-31 PC$5.00/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines: for Automatic Data Processing Physical Security and Risk Management. Category: ADP Operations. Subcategory: Computer Security.
Federal information processing standards pub. Jun 74, 97p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data processing security, Risk, Reliability, Disasters, Fire safety, Management.
Identifiers: *Federal information processing standards, *Computer information security, *Computer privacy.

This publication provides guidelines to be used by Federal organizations in structuring physical security programs for their ADP facilities. It treats security analysis, natural disasters, supporting utilities, system reliability, procedural measures and controls, off-site facilities, contingency plans, security awareness and security audit. It contains statistics and information relevant to physical security of computer data and facilities and references many applicable publications for a more exhaustive treatment of specific subjects.

FIPS-PUB-32 PC$5.00/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Optical Character Recognition Character Sets. Category: Hardware Standard. Subcategory: Character Recognition.
Federal information processing standards pub. 1 Dec 74, 79p
Previously announced as COM-74-51223. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.

Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Optical character recognition device, *Symbols.
Identifiers: *Federal information processing standards.

This standard provides the description, scope, and identification for standard sets of graphic shapes to be used in the application of Optical Character Recognition (OCR) systems. Two font styles, known as Style A and B, are described. Style A comprises a font of 92 characters which is designed to provide a maximum of machine efficiency in reading under a wide variety of applications. Style B comprises a font of 96 characters, which stresses esthetic appearance, but which may be applied under a substantial range of applications. Three sizes of characters designated as Size I, III, and IV are presented. The basic requirements related to character positioning are also specified. Individual character drawings for both styles of character sets are included.

FIPS-PUB-33 PC$4.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Character Set for Handprinting. Category: Hardware Standard. Subcategory: Character Recognition.
Federal information processing standards pub. 1 Oct 74, 38p
Previously announced as COM-74-51063. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Handwriting, *Symbols.
Identifiers: *Federal information processing standards, *Optical character recognition.

This FIPS PUB announces the adoption of the American National Standard X3.45-1974, Character Set for Handprinting as a Federal Standard. This standard provides the description, scope, and application rules for a character set for handprinting. A major purpose of this standard is to reduce the cost of data input into ADP systems which use Optical Character Recognition (OCR) equipment.

FIPS-PUB-34 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guide for the Use of International System of Units (SI) in Federal Information Processing Standards Publications.
Federal information processing standards pub. 1 Jan 75, 6p
Previously announced as COM-75-50278. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Units of measurement, *Metric system.
Identifiers: *Federal information processing standards.

The use of SI (International System of Units) within the United States is increasing. The Secretary of Commerce has established the policy that publications of the Department will provide dual-dimensions to the extent practicable. The Federal Information Processing Standards (FIPS) Program in response to Public Law 89-306 (the Brooks Act) strives to improve the utilization of ADP equipment, goods and services within the Federal Government through the establishment of uniform Federal automatic data processing standards. These standards and guidelines which are published by the National Bureau of Standards as FIPS contain specifications which should be expressed as dual-dimensions. Accordingly, this guideline will be used in the preparation of all new FIPS PUBS and existing FIPS PUBS when revised.

FIPS-PUB-35 PC$4.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Code Extension Techniques in 7 or 8 Bits. Category: Hardware Standard. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 1 Jun 75, 39p
Previously announced as COM-75-50393. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standard, *Coding, *Symbols.
Identifiers: *Federal information processing standards.

This FIPS PUB announces the adoption of the American National Standard X3.41-1974, Code Extension Techniques for Use with the 7-Bit Coded Character Set of ASCII. This standard specifies methods of extending the 7-bit code of ASCII (FIPS 1), remaining in a 7-bit environment or increasing to an 8-bit environment, building upon the structure of ASCII to describe various means of extending the control and graphic sets of the code. It also describes techniques for constructing codes related to ASCII so as to allow application dependent usage without preventing the interchangeability of their data and describes 8-bit codes for general information interchange in which ASCII is a subset.

FIPS-PUB-36 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Graphic Representation of the Control Characters of ASCII (FIPS 1). Category: Hardware Standards. Subcategory: Interchange Codes and Media.
Federal information processing standards pub. 1 Jun 75, 21p
Previously announced as COM-75-50394. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Symbols, *Coding, *Graphic arts.
Identifiers: *Federal information processing standards.

This FIPS PUB announces the adoption of the American National Standard X3.32-1973, Graphic Representation of the Control Characters of American National Standard Code for Information Interchange. This standard specifies graphical representations for the 34 characters of ASCII (FIPS 1) for which a graphic representation is not indicated in FIPS 1. Graphical representations are given for the 32 control functions of columns 0 and 1 as well as the characters 'Space' and 'Delete'. Two forms of graphical representations for each of the 34 characters are provided: a pictorial symbol, and a 2-letter alphanumeric code.

FIPS-PUB-37 PC$3.50
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Synchronous High Speed Data Signaling Rates Between Data Terminal Equipment and Data Communications Equipment. Category: Hardware Standard. Subcategory: Data Transmission. General Services Administration Federal Standard 1001.
Federal information processing standards pub. 15 Jun 75, 18p
Previously announced as COM-75-50500. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data transmission.
Identifiers: *Federal information processing standards.

This FIPS PUB announces the adoption of the American National Standard X3.36-1975, Synchronous High Speed Data Signaling Rates Between Data Terminal Equipment and Data Communication Equipment, and is the same as Federal Standard Number 1001. This standard specifies a series of signaling speeds for synchronous high speed serial data transfer.

FIPS-PUB-38 PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines for Documentation of Computer Programs and Automated Data Systems. Category: Software. Subcategory: Documentation.
Federal information processing standards pub. 15 Feb 76, 55p
Previously announced as PB-250 867. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Computer programming.
Identifiers: *Federal information processing standards, *Computer program documentation.

These guidelines provide a basis for determining the content and extent of documentation for computer programs and automated data systems. Software development phases and related document types are identified, several examples of documentation options are given, and content guidelines for ten document types are provided. The ten document types are: Functional requirements document; Data requirements document; System/subsystem specification; Program specification; Data base specification; Users manual; Operations manual; Program maintenance manual; Test plan; Test analysis report. The guidelines are intended to be a basic reference and a checklist for general use throughout the Federal Government to plan and evaluate documentation practices.

FIPS-PUB-39 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Glossary for Computer Systems Security. Category: ADP Operations. Subcategory: Computer Security.
Federal information processing standards pub. 15 Feb 76, 24p
Previously announced as PB-251 212. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data processing security, *Dictionaries.
Identifiers: *Federal information processing standards.

This glossary provides an alphabetic listing of approximately 170 terms and definitions pertaining to privacy, and security related to data, information systems hardware and software. Multiple word terms are listed in natural order, synonyms are referenced, and glossary terms appearing within a definition are indicated.

FIPS-PUB-4 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Calendar Date. Federal General Data Standard Representations and Codes.
Federal information processing standards pub. 1 Nov 68, 7p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Time.
Identifiers: *Federal information processing standards, *Gregorian calendar.

This standard provides codes and representations for identifying the specific Years, Months, and Days of the Gregorian Calendar.

FIPS-PUB-40 PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines for Optical Character Recognition Forms. Category: Hardware Standard. Subcategory: Character Recognition.
Federal information processing standards pub. 1 May 76, 64p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Optical character recognition device, *Forms(Paper), Specifications.
Identifiers: *Federal information processing standards.

This publication provides materials relating to the design, preparation, acquisition, inspection, and application of OCR forms in data entry systems. Since the materials are advisory and tutorial in nature this publication has been issued as a guideline rather than as a standard in the FIPS publication series. Full color illustrations are employed to show specific features of reflective ink applications, a phenomena unique to OCR forms requirements. Appropriate references are made to cognizant standards in the OCR area.

FIPS-PUB-41 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Computer Security Guidelines for Implementing the Privacy Act of 1974. Category: ADP Operations. Subcategory: Computer Security.
Federal information processing standards pub. 30 May 75, 24p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Data processing security, Risk, Management.
Identifiers: *Federal information processing standards, *Privacy Act(1974), *Computer privacy, *Computer information security.

This publication provides guidelines for use by Federal ADP organizations in implementing the computer security safeguards necessary for compliance with Public Law 93-579, the Privacy Act of 1974. A wide variety of technical and related procedural safeguards are described. These fall into three broad categories: Physical security, information management practices, and computer system/network security controls. As each organization processing personal data has unique characteristics, specific organizations should draw upon the material provided in order to select a well-balanced combination of safeguards which meets their particular requirements.

FIPS-PUB-42 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Guidelines for Benchmarking ADP Systems in the Competitive Procurement Environment. Category: ADP Operations. Subcategory: Benchmarking for Computer Selection.
Federal information processing standards pub. 15 Dec 75, 12p
Previously announced as PB-249 586. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports, as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Computer systems hardware, *Bench marks, *Procurement.
Identifiers: *Federal information processing standards, *Computer software.

This publication provides general guidelines to best practice for use by Federal agencies in benchmark mix demonstrations for validating hardware and software performance in context with processing an expected actual workload. The publication treats selection of the benchmark mix, sanitation of the benchmark mix, planning for the benchmark mix demonstration, and conducting the benchmark mix demonstration.

FIPS-PUB-43 PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Aids for COBOL Program Conversion (FIPS PUB 21 to FIPS PUB 21-1). Category: Software. Subcategory: Programming Language.
Federal information processing standards pub. 1 Dec 75, 59p
Previously announced as PB-247 653. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *COBOL, *Conversion.
Identifiers: *Federal information processing standards.

Since COBOL is a 'living' language, in the sense that it is under constant development and clarification, the Federal community which relies heavily on COBOL to satisfy programming needs has a large degree of assurance that COBOL will continue to meet their needs as future generation systems are introduced. However, along with the advantage of having more sophisticated and better COBOL tools to meet new systems requirements, there is a short term disadvantage. As clarifications and new facilities are added, they interact with the language specifications already standardized, and this interaction sometimes requires changes in source programs. An analysis, in the form of narrative descriptions and syntax comparisons, is provided to aid the transition of COBOL programs from use with compilers developed in accordance with the 1968 COBOL Standard (FIPS PUB 21) to compilers developed in accordance with the 1974 COBOL Standard (FIPS PUB 21-1).

FIPS-PUB-5-1 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: States and Outlying Areas of the United States. Federal General Data Standard Representations and Codes.
Federal information processing standards pub. 1 Nov 68, 8p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote. Supersedes FIPS-PUB-5, PB-194 344.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Abbreviations, *United States.
Identifiers: *Federal information processing standards.

This publication provides names, abbreviations, and codes for representing the 50 States, the District of Columbia, and the outlying areas, all of which are considered to be 'first order subdivisions' of the United States for use in the interchange of formatted machine sensible data.

FIPS-PUB-6-2 PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Counties and County Equivalents of the States of the United States. Federal General Data Standard Representations and Codes.
15 Sep 73, 36p
Supersedes FIPS-PUB-6-1, COM-73-50829.
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, *Abbreviations, *Counties, *United States.
Identifiers: *Federal information processing standards.

This publication provides names and codes for representing the Counties of the 50 States or county equivalents thereof for use in the interchange of formatted machine sensible data. Also included in the set of codes are the independent cities of Maryland, Missouri, Nevada, and Virginia and the Census Divisions and boroughs of Alaska.

FIPS-PUB-7 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Implementation of the Code for Information Interchange and Related Media Standards. Hardware Standards Interchange Codes and Media.
Federal information processing standards pub. 7 Mar 69, 17p
Supplement to Rept. nos. FIPS-PUB-1, FIPS-PUB-2, and FIPS-PUB-3. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.

Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Cost effectiveness, Benefit cost analysis.
Identifiers: *Federal information processing standards.

Public Law 89-306 authorized the Secretary of Commerce to make appropriate recommendations to the President relating to the establishment of uniform Federal automatic data processing standards. The purpose of this memorandum is to identify the objectives of these standards and relate the specific standards to these objectives, and to provide instructions for application.

FIPS-PUB-8-4 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Standard Metropolitan Statistical Areas. Federal General Data Standard Representations and Codes.
Federal information processing standards pub. 30 Jun 74, 22p
Supersedes FIPS-PUB-8-3. Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Identifying, Coding, Urban areas.
Identifiers: *Federal information processing standards, *Standard metropolitan statistical areas.

This publication provides standard identifications and codes for representing Standard Metropolitan Statistical Areas for the interchange of machine sensible data among agencies. It supersedes FIPS 8-3, Standard Metropolitan Statistical Areas, dated 1973 August 15. The general concept of a Standard Metropolitan Statistical Area, commonly referred to as SMSA is one of an integrated economic and social unit with a recognized large population nucleus. The codes are available on Hollerith punched cards. The following data elements are provided: SMSA Title (Name) and SMSA Code.

FIPS-PUB-9 PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Federal Information Processing Standards Register: Congressional Districts of the United States. Federal General Data Standard Representations and Codes.
Federal Information processing standards pub. 14 Nov 69, 4p
Also available in 3 ring vinyl binder, North American Continent price, $6.25; all others write for quote.
Paper copy also available in set of 44 reports as FIPS/SET-76, PC$10,000.00.

Descriptors: *Data processing, *Standards, Identifying, Coding.
Identifiers: *Federal information processing standards, *Congressional districts.

Congressional districts are considered to be any of the districts into which a State is divided for the purpose of electing representatives to the House of Representatives of the United States Congress. This standard provides codes for representing the congressional districts identified in the various Congresses of the United States.

NTIS/PS-76/0722/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Trends in Computer Technology (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
David W. Grooms. Sep 76, 26p*
Supersedes NTIS/PS-75/657.

Descriptors: *Bibliographies, *Computer systems hardware, *Computer programming, *Trends, Computer networks, Forecasting, Economic development, Data processing, Logic devices, Time sharing, Minicomputers, Parallel processors.
Identifiers: Computer applications, *Computer software.

Past, present, and future trends in computer hardware development and computer software generation are reviewed. The bibliography also presents prospects, problems, and pitfalls in the development of computer technology, as well as studies of trends in the Soviet Union. (This updated bibliography contains 64 abstracts, 21 of which are new entries to the previous edition.)

NTIS/PS-76/0748/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Automatic Programming (A Bibliography with Abstracts).
Rept. for 1964-Aug 76,
David W. Grooms. Sep 76, 56p*
Supersedes NTIS/PS-75/594.

Descriptors: *Bibliographies, *Computer programming, Programming languages, Semantics, Compilers, Maintenance, Data processing, Time sharing, Computer graphics.
Identifiers: *Automatic programming, Debugging(Computers).

Principles and applications of automatic programming are researched. The programming languages used in automatic programming, techniques for debugging, and semantic models are included. (This updated bibliography contains 51 abstracts, 11 of which are new entries to the previous edition.)

PAT-APPL-674 356/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Memory Wire and Synchronous Plating Techniques Therefore.
Patent Application,
Charles Bennett, and Emil Toledo. Filed 7 Apr 76, 17p AD-D002 872/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Magnetic film memories, Magnetic recording systems, Wire, Copper alloys, Beryllium alloys, Copper, Magnetic alloys, Plating, Diameters.
Identifiers: *Patent applications, PAT-CL-340-174.

The patent application relates to a continuously plated wire of continuously varying diameter suitable for use as a memory element, and techniques for producing such a wire to achieve (1) improved 'bit disturb' characteristics (2) increased output voltage therefrom comparable to a continuously plated wire of uniform diameter, and (3) a reduction in creep tendency of the wire. The techniques include operating on the surface of the wire by superimposing an alternating current at the plating and/or polishing stage(s) to create a ringed cross-section of the wire to effectively increase the surface magnetic path length between adjacent bits - a wire of periodically varying diameters along its length.

PAT-APPL-700 683/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
An Electro Optic Binary Adder.
Patent Application,
Henry F. Taylor. Filed 28 Jun 76, 15p AD-D002 889/4
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Binary processors, Electrooptics, Addition, Binary arithmetic, Optical waveguides, Polarization, Arrays.
Identifiers: *Patent applications, PAT-CL-235-175, *Adding circuits.

The patent application relates to an electro-optic adder which eliminates the requirement for serial logic operations in adding binary bits and greatly reduces the number of sequential steps needed to add numbers of high precision. A common substrate supports a plurality of waveguides numbering one more than the number of bits in the binary addends to be summed. Linearly polarized light is transmitted along each of the waveguides and a plurality of electrodes connectable to an electrical potential representative of a binary bit. The electrodes have discrete lengths contiguous to the waveguides for causing pi-radian phase retardation of light propagation upon application of the electrical potential. A polarization separator receives the output of each waveguide and produces signals commensurate with orthogonally polarized components. Photo detectors responsive to the signals representing each of the components produce commensurate electrical output signals which are, in turn, amplified and compared in an analog comparator for producing a binary output signal representative of the relative amplitudes of each pair of signals representing the orthogonally polarized components in each of the waveguides.

PATENT-3 958 109
Not available NTIS
Department of the Navy Washington D C
Universal Modularized Digital Controller.
Patent,
Donald W. Doherty, and Elbert J. Wells, Jr. Filed 20 Jan 75, patented 18 May 76, 26p AD-D002 898/5, PAT-APPL-542 485
Supersedes AD-D001 754.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Control systems, *Patents, Digital systems, Closed loop systems, Modules(Electronics), Interfaces, Servomechanisms, Analog systems, Drives, Digital to analog converters, Fire control computers.
Identifiers: PAT-CL-235-151.

The patent relates to a modularized digital controller which serves as a means of achieving dynamic compensation and also acts as an interfacing device in a closed-loop digital servo-control configuration. The controller incorporates four functional modules, the first of which is designed for the particular type of system being controlled and the remaining three being identical for all systems. A non-linear or course control mode is employed during the period of synchronization to large input commands from a master source and, after the system dynamic error has been reduced to a nominal size, a linear control algorithm is used.

PATENT-3 965 462
Not available NTIS
Department of the Air Force Washington D C
Serpentine Charge-Coupled-Device Memory Circuit.
Patent,
Ronald A. Belt. Filed 9 May 75, patented 22 Jun 76, 4p AD-D002 851/4, PAT-APPL-576 059
Supersedes AD-D000 816.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Memory devices, *Patents, Charge coupled devices, Shift registers, Arrays.
Identifiers: *Semiconductor computer storage, PAT-CL-340-173.

The patent relates to an improved serpentine charge-coupled-device memory circuit provided by alternately interleaving linear-shift registers of adjacent arrays, and placing non-refresh turn-around circuits in the CCD channel. This structure provides approximately twice the available space for the width of the refresh-turn circuitry over that of prior art devices so that better and more complex refresh-turn amplifiers and circuits may be used.

PATENT-3 970 833
Not available NTIS
Department of the Navy Washington D C
High-Speed Adder.
Patent,
William Frederick Gehweiler, and Junius Issac Pridgen. Filed 18 Jun 75, patented 20 Jul 76, 13p AD-D002 914/0, PAT-APPL-588 104
Supersedes AD-D001 265.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Arithmetic units, *Patents, Logic circuits, Digital computers.
Identifiers: PAT-CL-235-175, *Adding circuits.

The patent describes a high-speed adder circuit capable of performing addition with binary numbers in 1's complement, 2's complement or sign-magnitude formats. The adder can be made in the form of a single chip that can be assembled in multiple units to expand its capacity. There is a provision for converting minus zero to plus zero so as to prevent oscillations from occurring in the loop circuit. Also, the sum output is automatically shifted to the correct format when an overflow condition occurs.

PB-256 890/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
Assisting Network Users with a Network Access Machine.
Final rept.,
Robert P. Blanc. 1974, 6p
Pub. in Proceedings of Annual Conference of the Association for Computing Machinery, San Diego, Calif., November 11-13, 1974, v1 p74-78 1974.

Descriptors: *Computer networks, Minicomputers, Interfaces.
Identifiers: *Network access machine, *Access procedures, Protocols.

Accessing networks of heterogeneous computer systems can often be cumbersome due to differences in command languages and conventions. Approaches toward improving these conditions are identified and a specific solution - a Network Access Machine - is described in detail. The Network Access Machine is a minicomputer-based system that acts as a network access point for a user at his terminal and assists the user through the automatic execution of access procedures. This minicomputer facility allows the user to specify (or to have specified) his own network commands. The minicomputer expands these commands into command sequences executable on a specified network and host connected to that network. Further, system and network responses are analyzed to assure agreement with those anticipated for specific commands. Conditional and parameterized expansions allow the use of the same commands on different host computers and different networks.

PB-256 996/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
Computer-Aided Design in Manufacturing.
Final rept.,
Paul Meissner, and John M. Evans. Feb 74, 17p
Proceedings of Technology Workshops, held at Lafayette, Ind., on Oct 3-6, 1973, and Columbus, Ohio, on Nov 7-10 1973. Pub. in The Automation Research Council, n5 p289-303 Feb 74.

Descriptors: *Manufacturing, Economic analysis, Computer graphics.
Identifiers: *Computer aided design.

This review of the use of computer-aided design in manufacturing is based primarily on the experiences of General Motors, McDonnell Douglas, and the Army Electronics Command. The paper provides a common base for discussions by representatives of Government, industry, and universities attending two Workshops on the Technologies of Automation sponsored by the Automation Research Council of the American Automatic Control Council. The material illustrates the current state-of-the-art in CAD, including available hardware and software, and the economics and time savings of existing CAD systems.

PB-257 087/7GA PC$4.50/MF$3.00
California Univ., Livermore. RISOS Project.
Security Analysis and Enhancements of Computer Operating Systems.
Final rept. Jul 74-Dec 75,
R. P. Abbott, J. S. Chin, J. E. Donnelley, W. L. Konigsford, and S. Tokubo. Apr 76, 70p*
NBSIR-76-1041
Contracts NBS-S-413558-74, ARPA Order-2166

Descriptors: *Data processing security, *Operating systems(Computers), Upgrading, Time sharing, Multiprogramming, Compilers.
Identifiers: IBM-360 computers, UNIVAC-1100 computers, PDP-10 computers, TENEX system, *Computer privacy.

The protection of computer resources, data of value, and individual privacy has motivated a concern for security of EDP installations, especially of the operating systems. In this report, three commercial operating systems are analyzed and security enhancements suggested. Because of the similarity of operating systems and their security problems, specific security flaws are formally classified according to a taxonomy developed here. This classification leads to a clearer understanding of security flaws and aids in analyzing new systems. The discussions of security flaws and the security enhancements offer a starting reference for planning a security investigation of an EDP installation's operating system.

PB-257 208/9GA PC$3.50/MF$3.00
National Oceanic and Atmospheric Administration, Washington, D.C. Center for Experiment Design and Data Analysis.
Data Editing--Subroutine EDITQ.
Technical memo.,
Donald T. Acheson. Jun 75, 17p NOAA-TM-EDS-CEDDA-6, NOAA-75062703

Descriptors: *Editing routines, FORTRAN, Subroutines, Curve fitting, Least squares method, Computer programs.
Identifiers: *EDITQ computer program.

EDITQ is a general-purpose routine designed to edit data, i.e., to remove or flag wild or ridiculous or merely suspicious data values. Data are input as a sequence of paired independent and dependent variables. The principal outputs are the same data with edited data points flagged; the three coefficients of a second-order polynomial fitted to all accepted, but no rejected, data points; the covariance matrix of these coefficients; and the residual variance.

PB-257 223/8GA PC$5.00/MF$3.00
National Oceanic and Atmospheric Administration, Suitland, Md. Office of Management and Computer Systems.
Organization Chart Generation Using Computer Graphics.
Technical memo.,
Theodore R. Sabine. Apr 76, 76p NOAA-TM-ADMIN-OMCS-1, NOAA-76060902

Descriptors: *Organization charts, *Computer graphics, Computer programs, FORTRAN, Plotting, Microfilm reader-printers.
Identifiers: IBM-360/195 computers.

The generation of organization charts using computer graphics is described. Chart input data, entered from an input file, are processed by an IBM 360/195 FORTRAN program using the NOAA FR 80 Integrated Graphics System. Computer output is written onto a magnetic tape which is processed on an FR 80 Microfilm Recorder to produce a film strip containing images of the organization charts. The images can be recorded either at 310mm full size or at a 35mm reduction. After the film strip is developed on an off-line processor, the 35mm chart images can be enlarged to any desired size.

9D. Information Theory

AD-A029 556/8GA PC$4.50/MF$3.00
Maryland Univ Baltimore County Baltimore Div of Mathematics and Physics
Exponential Fourier Densities on S2 and Optimal Estimation and Detection for Directional Processes.
Interim rept.,
James Ting-Ho Lo, and Linda R. Eshleman. Jul 76, 53p MRR-RR-76-8, AFOSR-TR-76-1031
Grant AF-AFOSR-2671-74

Descriptors: Fourier analysis, Probability density functions, Exponential functions, Information theory, *Signal processing, Recursive functions, Spheres, Rotation.
Identifiers: *Exponential Fourier densities, *Optimal estimation, Conditional distribution.

Two classes of probability densities, the exponential Fourier densities and the exponential trigonometric densities, are introduced on S2 as well as four kinds of displacements. In general, neither class is closed under the operation of taking conditional distributions with respect to any of the displacements. A combined usage of both classes is required to study the estimation and detection models obtained from various combinations of the displacements. The merits and disadvantages of each model are discussed. Recursive formulas for the conditional densities and the likelihood ratios are derived for many of the models. The additive measurement noise case is also considered in detail. An error criterion for direction estimation is presented with respect to which the optimal estimates can be easily computed from the probability distribution. A deficiency of the models and techniques developed in this paper is that random driving terms are disallowed in the signal processes. How to remove this deficiency remains an open problem. (Author)

9E. Subsystems

AD-A029 211/0GA PC$5.00/MF$3.00
Naval Research Lab Washington D C
Computer-Aided Analysis of Dissipation Losses in Isolated and Coupled Transmission Lines for Microwave and Millimeter-Wave Integrated-Circuit Applications.
Interim rept.,
Barry E. Spielman. Jul 76, 98p Rept no. NRL-8009

Descriptors: *Strip transmission lines, *Microwave equipment, *Integrated circuits, *Computer aided design, Dissipation, Losses, Charge density, Computer programs, FORTRAN.
Identifiers: Directional couplers, Method of moments.

The analysis employs a quasi-TEM model for uniform isolated transmission lines and for the even- and odd-mode transmission lines associated with coupled-line structures. The conductor and dielectric losses in these structures are then related to equivalent charge-density distributions, which are evaluated using a method-of-moments solution. The transmission lines treated by this which are evaluated using a method-of-moments solution. The transmission lines treated by this analysis may contain any number of lossy conductors and inhomogeneous dielectrics, consisting of any number of different homogeneous dielectric regions. After explicit expressions are developed for use in evaluating conductor and dielectric loss coefficients for the even and odd modes of coupled transmission lines a development is provided to explicity relate the four-port, terminal, electrical performance of directional couplers to the modal loss coefficients. Losses are evaluated for examples of four isolated transmission lines and one coupled transmission line. For microstrip and coplanar waveguide the computed loss coefficients are in reasonable agreement with experimental data. For inverted microstrip and trapped inverted microstrip, evaluations presented in both tables and graphs provide useful design information for circuit applications. A comparison is made of the total loss characteristics of microstrip, coplanar waveguide, inverted microstrip, and trapped inverted microstrip. The utility of the analysis for coupled-transmission-line losses is illustrated for the example of edge-coupled microstrip with a dielectric overlay by comparing computed loss characteristics with measured values.

AD-A029 213/6GA PC$4.00/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
A Neutron Hardness Assurance Screen Based on High-Frequency Probe Measurements.
Final rept.,
R. A. Bailey, M. A. Ussery, and P. J. Vail. Aug 76, 34p Rept no. AFWL-TR-76-503
Presented at IEEE Conference, 28 Jul 76, San Diego, Calif.

Descriptors: *Radiation hardening, *Neutron irradiation, *Test methods, *Simulators, Alternating current, Electrodes, *Integrated circuits, *Transistors, Radiation damage, Predictions, Quality control.
Identifiers: AC Probes, Radiation simulators.

The objective of this study was to devise wafer level AC measurement procedures as an aid to the development of production line radiation hardness assurance screens and controls for complex Integrated Circuits (ICs). This objective was met using a commercially available AC probe and associated test equipment in conjunction with removable probe pads connected to critical circuit node points. The procedure was demonstrated for the test case of 100% electrical screens for neutron effects on transistors on dielectrically isolated linear circuits. Prediction accuracies (using a damage factor obtained independently) averaged 4% with a 4% standard deviation. This test case was only a part of the more general development program which is still in progress. A number of other applications for the measurement procedure are described. (Author)

AD-A029 214/4GA PC$3.50/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
Instrumentation and Test Procedures for Neutron Rapid Annealing Tests on TTL MSI Circuits.
Final rept.,
Craig R. Worcester, Phillip A. Young, and Robert J. Antinone. Aug 76, 18p Rept no. AFWL-TR-76-505
Presented at IEEE Conference, 28 Jul 76, San Diego, Calif.

Descriptors: *Transistor transistor logic, *Logic circuits, *Integrated circuits, Annealing, Analog systems, Comparators, Instrumentation.
Identifiers: *Medium scale integrated circuits.

A special instrument was designed at the Air Force Weapons Laboratory to perform rapid annealing tests on MSI logic circuits. This unit uses high-speed analog comparators to determine the state of the output of the device under test--logic zero, logic one or intermediate. The signals from the comparators are then digitally compared with the expected result which was previously stored. The response of the device under test to 80 input test patterns is determined at four decades of time following a radiation burst.

AD-A029 219/3GA PC$3.50/MF$3.00
Army Electronics Command Fort Monmouth N J
Antenna Array for Limited Scan Applications.
Technical rept. Jan 75-Jun 76,
R. A. Stern. Jul 76, 15p Rept no. ECOM-4423

Descriptors: *Antenna arrays, *Phased arrays, Beam steering, Phase shift, Antenna feeds, Ferrites, S Band, Lightweight, Low costs.

A novel type of S-band line source antenna is described which could become the basis for a relatively lightweight, compact, low cost phased array. The line source is a series-fed array of radiating slots periodically situated in the side wall of an S-band waveguide section. The unit, which utilizes nonreciprocal, latching, ferrite phase shifters situated between adjacent slots, is capable of switching beam position in less than 10 micro sec and is designed to operate at peak power levels >3Kw. (Author)

AD-A029 224/3GA PC$5.00/MF$3.00
Mcdonnell Douglas Astronautics Co-East St Louis Mo
Integrated Circuit Electromagnectic Susceptibility Investigation - Phase III IC Susceptibility Handbook - Draft 1,
J. M. Roe. 4 Jun 76, 100p MDC-E1515,
NSWC/DL-TR-3506
Contract N60921-76-C-A030

Descriptors: *Integrated circuits, Radiofrequency interference, Degradation, Hardening, Vulnerability, Handbooks, Failure(Electronics).

The objective of this handbook is to provide system designers with integrated circuit (IC) susceptibility information in terms of microwave signals. This is the first draft of the IC Handbook for comments from eventual users. The data in the handbook include interference susceptibility from testing and modeling, degradation from testing, and catastrophic failure from testing. Both digital and linear ICs are covered in the handbook. This version includes all data available at the end of the first of three increments of the susceptibility investigation. The handbook explains the electromagnetic vulnerability (EMV) hardening approach for electronic systems. On the component level susceptibility reduction techniques such as use of lossy ferrite materials and screening for less susceptible devices are included. This handbook will provide designers with actual test data when available and modeling techniques to determine susceptibility information when no test data are available. (Author)

AD-A029 232/6GA PC$4.00/MF$3.00
K and M Electronics West Springfield Mass
Cyclops Power Supply (Type B).
Final rept. 25 Jul 75-30 May 76,
James L. Knak. 30 Jun 76, 47p Rept no. 1011
Contract DAAG53-76-C-0006
Availability: Microfiche copies only.

Descriptors: *Power supplies, *Night vision devices, *Goggles, *Image intensifiers(Electronics), Low costs, High voltage, Voltage regulators, Alternating current, Control systems.

The work performed under contract DAAG53-76-C-0006 has resulted in a power supply design which can be manufactured at a cost considerably less than present goggle tube power supplies. Several design approaches were evaluated to establish the lowest cost without sacrificing required performance.

AD-A029 364/7GA PC$5.50/MF$3.00
Rome Air Development Center Griffiss AFB N Y
VHF/UHF Antenna-to-Antenna Coupling Test Report.
Rept. for 1 Jun-1 Oct 73,
Kenneth R. Siarkiewicz, and Robert L. White. Jun 76, 115p Rept no. RADC-TR-76-180

Descriptors: *Antennas, *Coupling(Interaction), *Electromagnetic compatibility, *Dipole antennas, Very high frequency, Ultrahigh frequency, Frequency response, Gain, Transmitters, Receivers, Standing wave ratios.
Identifiers: Communication antennas, Vertical polarization, Disc cone antennas.

This report presents the results of coupling measurements made between pairs of commonly used communications antennas (i.e., AT-197, AS-1018, AS-1097, and AS-1181). The coupling was measured as a function of the horizontal and vertical separation distances between the antenna. The measurements were made over a frequency range of 100 MHz to 400 MHz, and the coupling is presented as a function of frequency on oscillographs.

AD-A029 377/9GA PC$3.50/MF$3.00
Washington Univ Seattle Dept of Electrical Engineering
Radiation Synthesis Studies.
Final rept. 31 Jan 71-31 Oct 73,
Akira Ishimaru. Oct 73, 15p AFCRL-TR-73-0688
Contract F19628-71-C-0112

Descriptors: *Antennas, *Reflectors, *Antenna radiation patterns, Synthesis, Cassegrain antennas, Parabolic antennas, Phased arrays, High gain.
Identifiers: Torus reflectors, Double spherical reflectors, *Spherical cassegrain antennas, Feed Displacement.

The final report gives a summary of all the work completed under this contract covering the period from January 1971 to September 1973. The work covers a broad spectrum including double-spherical cassegrain reflector, high gain multibeam reflector antennas and paraboloic torus reflector. The emphasis is directed towards generating new ideas for practical antennas. Success in our effort is evidenced by the lists of reports and publications. (Author)

AD-A029 437/1GA PC$4.50/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
Blast Tests of a Mobile Satellite Tracking Antenna and of Two Model Antennas.
Final rept.,
Rodney Abrahams, Brian P. Bertrand, and Richard J. Pearson. Aug 76, 63p Rept no. BRL-MR-2661

Descriptors: *Parabolic antennas, *Satellite tracking systems, *Shock resistance, *Satellite communications, Shock tubes, Scale models, Response, Strain gages, Blast loads, Accelerometers, Antenna masts, Shock waves.
Identifiers: AN/GSC-86, Communication antennas.

A mobile satellite tracking antenna was subjected to blast waves emerging from the open end of an eight foot diameter shock tube. Response data were obtained by the use of strain gages and an accelerometer. Two similarly instrumented simple model antennas were also tested within the shock tube. (Author)

AD-A029 488/4GA PC$5.00/MF$3.00
Westinghouse Defense and Electronic Systems Center Baltimore Md Aerospace and Electronic Systems Div
Installation and Test of the Compensated Waveguide Antenna at Buffalo, New York, Runway 23 Glideslope Site.
Interim rept. Jan 75-Feb 76,
R. Littlepage, R. A. Moore, G. Moussally, and A. Zahorchak. Feb 76, 77p FAA-RD-76-9
Contract DOT-FA74WA-3360

Descriptors: *Antennas, *Glide path systems, Instrument landings, Sidelobes, Compensation.
Identifiers: *Waveguide antennas, *Compensated waveguide antennas.

By using previously developed techniques for digitally modeling terrain, an antenna site was determined which would provide Category II performance using the compensated waveguide antenna. The effects of reflections from the runway embankment and irregularities of the terrain were minimized by a combination of compensation, coning and antenna placement. Pattern measurements and antenna feed measurements were made at the Westinghouse Antenna Range and these provided information necessary for the installation and tuning of the antenna at Buffalo. Once installed, flight test information required small changes to the antenna feed system in order to meet Category II requirements. Initially, the monitor system exhibited some instability but this was solved by using new loops and re-configuring the monitor channels. (Author)

AD-A029 546/9GA PC$7.75/MF$3.00
Mississippi Univ University Dept of Electrical Engineering
Analysis of the Air Force Weapons Laboratory's Horizontally Polarized Dipole Electromagnetic Pulse Simulator.
Final rept. Mar 75-Aug 76,
Chalmers M. Butler, K. R. Umashankar, and Donald R. Wilton. Aug 76, 219p AFOSR-TR-76-1073
Grant AF-AFOSR-2825-75

Descriptors: *Electromagnetic pulse simulators, *Antennas, Mesh, Wire, Polarization, Horizontal orientation, Mathematical prediction, Electromagnetic fields, Transients, Computer programs.
Identifiers: *Electromagnetic theory, Air Force Weapons Laboratory.

This report presents an analysis of the operating characteristics of the Horizontally Polarized Dipole Electromagnetic Pulse Simulator located at Kirtland Air Force Base, New Mexico. The analysis and an attendant computer program resulting from this work enable operators of the HPD Simulator to compute with reasonable accuracy and efficiency the transient electromagnetic field radiated by the simulator into a specified test volume. A theory is developed for the loaded loop radiator, which is constructed from cages of loaded wires, and coupled, integro-differential equations are formulated for the unknown current on the wires of the structure. These equations are solved in the frequency domain and desired radiated fields are computed via Fourier transform techniques. (Author)

AD-A029 644/2GA PC$4.00/MF$3.00
Mississippi Univ University Dept of Electrical Engineering
Static Analysis of Conical Antenna over a Ground Plane.
Final rept.,
Donald R. Wilton. Aug 76, 39p AFOSR-TR-76-1078
Grant AF-AFOSR-2832-75

Descriptors: *Electromagnetic pulse simulators, *Biconical antennas, Conical bodies, Conical antennas, Electric charge, Distribution, Integral equations, Capacitance, Height.

A static integral equation for the charge distribution on a cone over a conducting ground plane is developed. Numerical results are presented for the charge distribution, capacitance, and effective height of cones both with and without a topcap. (Author)

AD-A029 651/7GA PC$3.50/MF$3.00
American Electronic Labs Inc Lansdale Pa
Low-Level Modulator Development.
Final rept. 1 Dec 75-9 Jul 76,
Donald L. Talheim. 9 Jul 76, 16p
Contract N00014-74-C-0393

Descriptors: *Modulators, *Microwave equipment, *Semiconductor diodes, Low level, Insertion loss, Isolation, Response, Pulse duration modulation, C band, X band.

This report summarizes the development of a C/X Band Low Level Modulator. Test data on insertion loss, isolation, and response time are included. (Author)

PAT-APPL-622 285/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Broadband Millimeter Wave Amplifier.
Patent Application,
David Rubin. Filed 10 Oct 74, 8p AD-D002 869/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Microwave amplifiers, Millimeter waves, Broadband, Gunn diodes, Heat sinks, Waveguides, Tuning, Negative resistance circuits.
Identifiers: *Patent applications, PAT-CL-330-5.

The patent application relates to a millimeter wave amplifier having broadband characteristics in which a Gunn diode or other two terminal negative resistance device having an integral heat sink is center mounted in a reduced height waveguide. The heat sink is attached to a mechanism for selectively adjusting its penetration into the waveguide cavity. The introduction of the heat sink into the waveguide cavity creates a discontinuity to the propagation of energy which causes localized waveguide modes other than the dominant mode to exist. The adjustable position of the heat sink allows the reactance due to the introduction of these modes to be variable, proper adjustment resulting in the cancellation of the parasitic reactances inherent in the packaged negative resistance device.

PAT-APPL-686 855/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Multifrequency Array Using Common Phasors.
Patent Application,
Joseph H. Provencher. Filed 17 May 76, 11p AD-D002 876/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Phased arrays, *Multiple beam antennas, Phase shift circuits, Multiple operation, Antenna arrays, Multiple beams(Radiation).
Identifiers: *Patent applications, PAT-CL-343-854.

The patent application relates to a single antenna array having a phase shifter at the input of each antenna element and fed by a multifrequency input for simultaneously generating at least two beams. When the different excitation frequencies are simultaneously inputted into the phase shifters, a separate phase increment is introduced into each radiatio for each frequency. The result is a separate beam output from each frequency input, the beams being generated simultaneously but at different beam pointing angles.

PAT-APPL-690 699/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Acoustic Surface Wave Device.
Patent Application,
Mark A. Riches. Filed 27 May 76, 8p AD-D002 879/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Signal processing, Acoustic waves, Surface waves, Electromagnetic wave filters, Phase, Spurious effects, Suppressors.
Identifiers: *Patent applications, PAT-CL-325-465, Acoustic surface waves, Acoustic surface wave devices, Interdigital transducers.

The patent application relates to a surface acoustic wave coupler that filters electromagnetic leakage out of the coupled signal. Disclosed is a centrally positioned sender with receivers on each side, the outputs of which are fed to a difference amplifier that provides the system output. One receiver is more remote from the sender than the other so that the acoustic waves received will be out of phase, while the electromagnetic leakage will be in phase. The output of the difference amplifier is indicative of the total acoustic energy, with the electromagnetic leakage suppressed.

PAT-APPL-697 514/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Parallel/Time-Shared Variable Time Delay Generator with Common Timing Control and Fast Recovery.
Patent Application,
Charlie F. Reeves. Filed 18 Jun 76, 24p AD-D002 887/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Blanking(Electronics), Multivibrators, Delay circuits, Recovery, Radar equipment, Receivers, Pulse generators.
Identifiers: *Patent applications, PAT-CL-343-5, Monostable multivibrators.

The patent application relates to a variable time-delay generating network which has the capability of generating blanking pulses at significantly higher pulse repetition frequencies than those possible with other prior art circuits. This capability is achieved by a quick recharge electronic structure for substantially reducing the circuit recovery time of the blanking system

delay one-shots. The capability is also enhanced by use of a parallel auxiliary delay one shot which is enabled only during the timing cycle of the main delay one-shot to effectively double the maximum PRF above the limit achieved by recovery time reduction and by dual constant-current sources controlled by a single potentiometer to insure that the delay pulse widths generated by the main and auxiliary delay one-shots are equal.

PATENT-3 947 850 Not available NTIS
Department of the Navy Washington D C
Notch Fed Electric Microstrip Dipole Antenna.
Patent,
Cyril M. Kaloi. Filed 24 Apr 75, patented 30 Mar 76, 10p AD-D002 894/4, PAT-APPL-571 153
Supersedes AD-D002 261.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Dipole antennas, *Patents, Strip transmission lines, Conformal structures, Low drag, Antenna radiation patterns, Microelectronics, Antenna feeds, Aircraft antennas, Spacecraft antennas, Guided missile antennas, Antenna arrays.
Identifiers: PAT-CL-343-795.

The patent relates to a notch fed electric microstrip dipole antenna consisting of a thin electrically conducting, rectangular-shaped element formed on one surface of a dielectric substrate, the ground plane being on the opposite surface. The length of the element determines the resonant frequency. The feed point is located in a notch along the centerline of the antenna length and the input impedance can be varied by moving the feed point along the centerline of the antenna without affecting the radiation pattern. Of all the many types of microstrip antennas built to date, this antenna offers the best advantages as far as arraying of the elements are concerned. The notched antenna can be arrayed using microstrip interconnecting transmission lines. The corner losses in the clad material and the width of the notch determines how narrow the element can be made.

PATENT-3 958 243 Not available NTIS
Department of the Navy Washington D C
Circuit for Generating a Digital or Analog Signal as a Function of Doppler Frequency.
Patent,
John L. Linder. Filed 20 Mar 75, patented 18 May 76, 10p AD-D002 903/3, PAT-APPL-560 060
Supersedes AD-D002 037. Previously filed as PAT-APPL-436 415, 25 Jan 74.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Sweep generators, *Patents, Satellite tracking systems, Doppler systems, Circuits, Digital systems, Analog systems, Signal generators, Receivers.
Identifiers: PAT-CL-343-8, *Function generators.

The patent relates to a control circuit having a digital memory for providing sweep voltages to receivers in a doppler satellite tracking station of proper amplitude and duration to ensure searching in the correct doppler frequency range. An internally generated ramp function voltage is combined with a reference voltage to produce a composite sweep signal for the receiver. The reference voltage level is determined either from a set of digiswitches or from a digital memory circuit which outputs a digital signal that is a function of the frequency of a received doppler signal.

PATENT-3 959 665 Not available NTIS
Department of the Navy Washington D C
Logic Circuits with Interfacing System.
Patent,
Jim A. Gilbreath, Robert P. Crabb, and Robert A. Unger. Filed 29 May 74, patented 25 May 76, 5p AD-D002 840/7, PAT-APPL-474 278
Supersedes AD-D000 621.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Logic circuits, *Patents, Drives(Electronics), Interfaces, Power supplies.
Identifiers: PAT-CL-307-208.

The patent relates to a driving logic circuit having input and output terminals and first and second power terminals described in combination with an interfacing means for making the driving logic circuit compatible with a driven logic circuit. This is accomplished by providing a first D.C. power source means which is connected across the first and second power terminals, and a second D.C. power source means which is connected in opposition to the first D.C. power means. With this arrangement the D.C. power to the power terminals is shifted to the extent of the voltage of the second D.C. power source means so as to be made compatible with the driving voltages required to drive the driven logic circuit.

PATENT-3 961 274 Not available NTIS
Department of the Navy Washington D C
Noise Riding Threshold.
Patent,
Robert W. Jones, and James K. Hall. Filed 10 Mar 75, patented 1 Jun 76, 4p AD-D002 842/3, PAT-APPL-557 191
Supersedes AD-D000 721.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Voltage regulation, *Patents, Threshold effects, Receivers, Noise, Automatic gain control.
Identifiers: PAT-CL-328-165.

The patent relates to a network for sensing video noise power over a wide dynamic range and outputting a voltage proportional to that noise power. The input signal is filtered, inverted and rectified to separate the noise component from the signal. The noise component is then converted to a negative level voltage which is added to first and second preset voltages. A non-linear output voltage which is a function of the first signal sum is provided for driving the voltage threshold devices in external equipment. A linear voltage output which is a function of the second signal sum is also provided for driving the voltage threshold devices of external equipment.

PATENT-3 961 282 Not available NTIS
Department of the Navy Washington D C
Tracking Status Detector for a Digital Delay Lock Loop.
Patent,
Chang Chwng Chen, Jack K. Holmes, and James L. Lewis. Filed 28 Apr 75, patented 1 Jun 76, 7p AD-D002 904/1, PAT-APPL-572 557
Supersedes AD-D001 186.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Phase locked systems, *Patents, Detectors, Tracking, Monitors, Phase locked communications, Digital systems, Analog systems.
Identifiers: PAT-CL-331-1.

An unlocked detector for a digital delay lock loop employs an up-down counter which periodically accumulates the algebraic sum of the quantized positive and negative adjustments made at a preselected rate by the incremental phase modulator. Whenever this sum reaches a specified threshold value corresponding to a particular phase error, an unlocked indication is given. Arrangements using the same principle are disclosed for analog loops.

PATENT-3 963 911 Not available NTIS
Department of the Air Force Washington D C
Hybrid Sample Data Filter.
Patent,
Lewis E. Franks. Filed 22 Apr 75, patented 15 Jun 76, 6p AD-D002 848/0, PAT-APPL-570 975
Supersedes AD-D000 800.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Filters, *Patents, Hybrid systems, Modulators, Delta modulation, Shift registers, Flip flop circuits, Nand gates, Coding, Demodulators.
Identifiers: PAT-CL-235-156.

The patent relates to a sample data filter using a delta modulator to feed a shift register of which selected outputs are pulsewidth weighted. Each of the coefficient multipliers include a flip-flop fed by one of the taps of the shift register and triggered by a clock. A synchronous counter, common to each of the multipliers, is fed to a NAND gate that clears the flip-flop. Interposed between the counter and the NAND gate are a series of switches, one for each stage of the counter. The flip-flop controls a switch to a source of reference voltage and the output of this switch controlled voltage from each of the multipliers is summed and fed to a demodulator.

PATENT-3 967 102 Not available NTIS
Department of the Air Force Washington D C
Self-Adjusting Digital Notch Filter.
Patent,
Rainer F. McCown. Filed 25 Mar 75, patented 29 Jun 76, 4p AD-D002 859/7, PAT-APPL-561 962
Supersedes AD-D000 783.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bandstop filters, *Digital filters, *Patents, Setting(Adjusting), Self operation.
Identifiers: *Notch filters, PAT-CL-235-152.

The patent relates to digital filter auto-adjustment to variations in input signals achieved by normalizing the output of the second of two substantially identical series-connected digital filter stages and subtracting the normalized output of the second filter stage from its input to provide a measure of filter signal residue power. Deviations of the signal residue power from the preset limits of a signal residue power standard are detected and signals responsive thereto are used to appropriately adjust variable bandwidth constants in both filter stages.

PB-256 853/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Electronic Technology Div.
The ARPA/IC/NBS Semiconductor Technology Program.
Final rept.,
Judson C. French. 1975, 12p
ARPA Order 2397

Pub. in Proceedings of Space System Microelectronics Seminar, Los Angeles, Calif., April 15-16, 1975, p189-199 1975.

Descriptors: *Integrated circuits, *Semiconductor devices, *Reliability(Electronics), *Process control, Microelectronics, Automation, Measurement, Silicon, Assembling, Processing, Production engineering, Quality control.

The program, Advancement of Reliability, Processing, and Automation for Integrated Circuits reflects an emphasis on in-process measurements and well controlled processes to achieve these objectives. Rather than following only the more traditional and costly approach of tested-in reliability, the program provides a new and complementary thrust directed toward the goal of built-in reliability through design, control of fabrication, and automation. Specific technical topics selected for attention cover key processing and assembly steps, from control of incoming materials to evaluation of electrical characteristics and packaging.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A029 331/6GA PC$12.50/MF$12.50
Tetra Tech Inc Arlington Va
1976 Energy Fact Book.
1975, 195p Rept no. ISBN-0-966646-01-7
Library of Congress Catalog Card No. 75-45508.

Descriptors: *Energy, *Handbooks, Research management, Foreign technology, United States, Policies, Legislation, Regulations, Crude oil, Natural gas, Nuclear energy, Coal, Oil shales, Fossil fuels, Reserves(Energy), Fuel consumption, Nuclear power plants, Synthetic fuels, Energy conversion, Imports, Economic analysis, Manuals.
Identifiers: *Energy sources, Research projects, Foreign countries, Energy policy, Government policies, National government, Petroleum, Coal gasification, Coal liquefaction, Tar sands, Supply(Economics), Demand(Economics), Coal reserves, Synthetic petroleum.

The shortage of petroleum products recently experienced made most Americans aware of the fact that the energy resources of this nation are not unlimited. What may not yet be apparent to the casual observer is that the total energy consumption of our nation must continue to increase even if we establish a successful conservation program, and that we are faced with a frightening spectrum of implications associated with such an increase in total energy consumption on the one hand, and the conservation programs we must institute, on the other. This Energy Fact Book is a guide to some of the current and potential alternative sources of energy that can be exploited in planning for a crisis-free energy equilibrium.

PB-256 044/9GA PC$5.00/MF$3.00
Federal Energy Administration, Washington, D.C. Office of Energy Conservation and Environment.
Final Assessment of the Environmental Impacts of the State Energy Conservation Program. (Public Law 94-163, Title III, Part C, The Energy Policy and Conservation Act).
Apr 76, 92p* FEA/D-76/363

Descriptors: *Energy conservation, *Environmental impacts, Legislation, Government policies, State government, Regulations, Electric power demand, Fuel consumption.
Identifiers: Public Law 94-163, Energy Policy and Conservation Act.

The Energy Policy and Conservation Act (EPCA) (Public Law 94-163) provides for a program to be administered by each state in which the State and Federal Governments may work in partnership to develop comprehensive energy conservation plans. The purpose of this report is to: (1) provide an environmental analysis of the cumulative national impact of the State Energy Conservation Program and, (2) provide environmental impact data that can be employed by the states in assessing the environmental impacts of energy conservation measures which might be a part of their programs.

PB-256 417/7GA PC$6.00/MF$3.00
Flynn and Emrich Co., Baltimore, Md.
Energy Conservation Techniques for the Iron Foundry Cupola.
Final rept. Jun 72-Dec 75,
Dennis J. Martin, and James J. McCabe, III. Mar 76, 131p EPA/600/2-76/071
Contract EPA-68-02-0286
Prepared in cooperation with York Research Corp., Stamford, Conn.

Descriptors: *Energy conservation, *Foundries, *Furnace cupolas, *Foundry engineering, *Iron and steel industry, *Air pollution abatement, Industrial engineering, Metal industry, Industrial plants, Industries, Furnaces, Design, Construction, Cost effectiveness, Drawings.

The report discusses various existing or emerging technologies that can be used to reduce the energy consumption and pollution control costs of typical cupola operations. It details options available to foundries in terms of technological devices which will conserve energy and capital. Included in the investigation were hot blast recuperation, divided blast, oxygen enrichment, and innovative pollution control equipment.

PB-256 569/5GA PC$4.50/MF$3.00
California Univ., Riverside. Center for Social and Behavioral Science Research.
Some Issues Regarding Regulatory Policy, Political Participation, and Social Implications of Geothermal Resource Development in the Imperial Valley,
Phyllis Strong Green, and Maureen Farnan Steinberger. Feb 76, 67p Working Paper-2, W76-11328
Prepared in cooperation with California Univ., Davis. Water Resources Center, UCAL-WRC-W-344.

Descriptors: *Geothermal energy conversion, *Energy policy, *Geothermal resources, Regulations, Legislation, Environmental impacts, Social effect, Government policies, Local government, Imperial Valley, California.

In order to delineate social and political issues relating to geothermal development, certain local government officials and community leaders in the Imperial Valley were interviewed on their perceptions of the potential of geothermal resources and regulatory problems implicit in development. County officials exhibited a strong belief that they had an overall responsibility for the general welfare of the residents of Imperial County who would be affected by the potential economic, social, and environmental impacts of geothermal development.

PB-256 640/4GA PC$5.00/MF$3.00
Data Resources, Inc., Lexington, Mass.
The Welfare Effects of Fuel Economy Policies.
Final rept.,
Lester D. Taylor, Philip K. Verleger, Jr., and Catherine J. Hirtzel. Jul 75, 86p MVMA-DAT-74-09
Contract DAT 7407-C6.3
Prepared in cooperation with Arizona Univ., Tucson.

Descriptors: *Fuel economy, *Government policies, Automobiles, Gasoline, Fuel consumption, Sales, Mathematical models, National government.
Identifiers: Fuel demand.

This report examines the questions and issues that surround the prospect of the Government setting standards of automobile fuel economy and effects of alternative policies that might be employed to achieve these standards. Policies that would affect fuel consumption and their likely impact on new car sales, the composition of the car stock, and the amount of gasoline consumed are assessed.

PB-256 701/4GA PC$4.00/MF$3.00
Northeastern Legislative Energy Staff, Albany, N.Y.
Northeastern Energy Perspectives: State Legislative Dialogues on the Energy Problems Confronting the Northeast Region.
Conference proceedings.
Dec 74, 40p NSF/RA-760113
Grant NSF-GT-43894

Descriptors: *Energy policy, Energy sources, Legislation, Regional planning, Meetings, New England, Pennsylvania, Delaware, New Jersey.
Identifiers: *Northeastern Region(United States).

Contents:
- Regional energy policy;
- Alternative sources of energy-myth or reality;
- Insufficient energy-environmental, economic and political trade-offs;
- State legislative use of science and technology;
- Energy staffing needs for state legislatures;
- The state legislative response-alternative energy proposals.

PB-256 714/7GA PC$10.75/MF$3.00
Resource Planning Associates, Cambridge, Mass.
The Exploration, Development and Production of Naval Petroleum Reserve Number 4.
Final rept.
19 Jul 76, 386p* FEA/S-76/368
Contract FEA-CR-05-60579-00

Descriptors: *Petroleum deposits, *Oil reserves, *Alaska, *Natural gas, Cost analysis, Economic analysis, Environmental impacts, Regulations, Legislation, Social effect, Government policies, National government, History, Planning.
Identifiers: *Naval petroleum reserves, Naval petroleum reserve 4.

This report briefly discusses the history of exploration in and the resource potential of NPR-4 and outlines likely levels of investment, manpower, and resources necessary to explore and develop NPR-4. Alternative management programs for NPR-4 exploration and development are analyzed and the likely social and environmental impacts of NPR-4 exploration and development are addressed.

PB-257 444/0GA PC$8.00/MF$3.00
Johns Hopkins Univ., Laurel, Md. Applied Physics Lab.
Maritime and Construction Aspects of Ocean Thermal Energy Conversion (OTEC) Plant Ships - Detailed Report,
W. H. Avery, R. W. Blevins, G. L. Dugger, and E. J. Francis. Apr 76, 232p* APL/JHU-SR-76-1B, MA-RD-940-T76074
Contract MA-5-38054

Descriptors: *Solar sea power plants, Electric power plants, Electric power generation, Ammonia, Heat exchangers, Hydrogen, Aluminum, Synthetic fuels, Offshore structures, Cost analysis, Cost estimates, Design, Drawings, Con-

struction, Feasibility, Atlantic Ocean, Pacific Ocean.

A very promising way to alleviate the Nation's energy problems, one that would greatly affect United States maritime activities, would be the rapid development of Ocean Thermal Energy Conversion (OTEC) plant-ships to produce energy-intensive products at sea. Such OTEC plant-ships would use the temperature difference between the warm surface layer and the cold deep layers of a tropical ocean to drive a heat engine to produce electric power that, in turn, would be used to produce ammonia, aluminum, liquid hydrogen, and/or other products. The construction, deployment, operation, and shipping support of these plant-ships are discussed.

10B. Power Sources

AD-A029 400/9GA PC$6.00/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Nuclear Engineering
Comparison of Environmental Impacts of Coal and Nuclear Systems for Military Utility Application and Consequences of Reactor Accidents.
Final rept.,
Michael R. Doyle, Michael W. Golay, and Norman C. Rasmussen. Feb 75, 126p
USAFESA-RT-2001
Contract DAAK02-74-C-0308

Descriptors: *Environmental engineering, *Energy management, *Heating plants, Coal, Gas cooled reactors, Military applications, Comparison, Reactor accidents, Radiation hazards, Cost analysis, Air pollution, Radioactivity.

This study compares the environmental impacts of a coal district heating station and a high temperature gas cooled reactor total energy system. In addition, the consequences of nuclear accidents are predicted. Radioactive, chemical and thermal emissions from the two plants are determined and methods of control are discussed. The costs of control systems are estimated from a variety of sources including current prices provided by manufacturers. The consequences of nuclear accidents are predicted by use of the computer model developed for the Wash 1400 Reactor Safety Study of the Atomic Energy Commission. This model predicts the number of acute deaths, illnesses, cancers, and genetic diseases and the monetary cost which would be expected from the worst possible accident at the nuclear plant. (Author)

AD-A029 407/4GA PC$5.00/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Nuclear Engineering
Economic Assessment of Nuclear and Fossil-Fired Energy Systems for DOD Installations.
Final rept.,
L. J. Metcalfe, and M. J. Driscoll. Feb 75, 93p
USAFESA-RT-2002
Contract DAAK02-74-C-0308

Descriptors: Fossil fuels, Reactor fuels, *Nuclear energy, Costs, Economic analysis, Cost analysis, Cost effectiveness, *Electric power plants, *Nuclear power plants, Gas turbines, Gas cooled reactors, Economics, Pressurized water reactors, Rankine cycle, Brayton cycle, Thermal utilization.
Identifiers: *Fossil-fuel power plants.

Costs of electricity and thermal energy (380 F hot water) produced by nuclear and fossil-fired power plants in the 100 Mwe size range for 1985 start-up have been estimated (in 1985 dollars, levelized over plant life). While the PWR/Rankine system was estimated to produce electricity as a sole product cheaper than an HTGR/Brayton plant (30.3 versus 41.5 mills/Kwhr) the HTGR unit was shown to produce Total Energy products more economically than the PWR (25.2 mills/Kwhn and 2.58 $/MBTU versus 30.3 and 2.93). Breakeven fuel costs for comparable fossil-fired steam-electric power plants were found to be about 16 $/ton for coal and 9 $/bbl for oil (approximately 10 $/ton and 6 $/bbl in 1974 dollars); oil-fired gas turbine units were found to have breakeven costs of 18 $/bbl (approximately 10.6 $/bbl in 1974 dollars). Parametric and sensitivity studies were also carried out to examine the affects of size (50-200Mwe), annual cost of money (8 - 12%), plant lifetime (20-40 years) and plant start-up date (1980-1990). It is concluded that the HTGR/Brayton plant is superior to the other nuclear and fossil/Rankine options for Total Energy applications. The fossil-fired gas turbine/total energy system is identified as a strong competitor for the proposed application, and is potentially superior to the HTGR if fossil fuel prices do not escalate prohibitively. (Author)

PB-256 198/3GA PC$7.50/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
Wind Energy Conversion.
Progress rept. 15 Jul 75-15 Feb 76,
R. H. Miller, M. Martinez-Sanchez, J. Dugundji, E. Larrabee, and T. Humes. 15 Feb 76, 183p
ASRL-TR-184-2, ERDA/NSF-00826/75-2, ,
NSF/RA-760160
Grant NSF-AER75-00826

Descriptors: *Wind power generation, *Turbines, Windmills, Wind(Meteorology), Aerodynamic loads, Aeroelasticity, Wind tunnel models.

Testing of the wind tunnel model and aeroelastic analyses indicate the scope of the problem involved in selecting a suitable speed for a wind turbine. This report discusses the probability that at least for conventional rotor type wind turbines, a constant tip speed rather than a constant ratio of tip speed to wind speed is a more satisfactory design solution. The penalty involved in maintaining constant tip speed is investigated as part of the control strategy research (Task I) in order to determine whether control should be considered for a constant speed or for variable speed (constant tip speed ratio) wind turbine. As a result of experience with the aeroelastic analyses (Task 3), it was decided to concentrate on the constant speed configuration. Task 2 is concerned with the experimental and theoretical investigation of airloads in the presence of wind shear and gust.

PB-256 420/1GA PC$4.50/MF$3.00
Exxon Research and Engineering Co., Linden, N.J. Government Research Lab.
Carbon Oxidation Catalyst Mechanism Study for Fuel Cells.
Final rept. Oct 74-Jun 75,
Yen-Chi Pan. Mar 76, 69p
EXXON/GRU.2DYBA.75/715520, EPA/600/2-76/057
Contract EPA-68-02-1831

Descriptors: *Graphite, *Fuel cell electrodes, *Oxidation, Catalysis, pH, Temperature, Electrochemistry, Potassium hydroxides, Reaction kinetics, Electrolytes, Hydrogen, Carbonates, Hydrogen peroxide.
Identifiers: Rotating disk electrodes.

The objectives of this study were to develop information about the electrocatalytic behavior of carbon and the reaction kinetics of oxygen reduction, and to determine whether any combination of conditions, (temperature, electrolyte concentration, and pH value) exist in which a carbon cathode could operate sufficiently well to be used in a practical fuel cell. A systematic examination of the electrocatalytic activity for oxygen reduction in various electrolytes was conducted, using a rotating ring-disk electrode.

PB-256 665/1GA PC$5.00/MF$3.00
Gilbert Associates, Inc., Reading, Pa.
Design Phase Utility Analysis for Gas Turbine and Combined Cycle Plants.
Final rept.,
P. A. Kadlec, and O. R. Martins. 12 Aug 76, 78p*
GAI-1915, FEA/G-76/369
Contract FEA-CO-05-60575-00

Descriptors: *Gas turbine power generation, *Combined-cycle power plants, *Load management, Electric utilities, Fossil-fuel power plants, Cost analysis, Comparison, Forecasting, Planning.
Identifiers: Combined cycle electric power generation, Peak loads, Coal fired power plants.

The objectives of this study are: (1) to analyze and identify those factors, trends and effects related to the usage of gas turbine (GT) and combined cycle (CC) power plants for base, intermediate and peaking load service as compared to alternate fossil fuel units for both public and privately owned utilities; (2) To forecast the future usage of GT and CC units to supply base, intermediate and peak load needs; (3) To examine and identify the engineering advantages and disadvantages of CC and GT technologies, and arrive at a definition for combined cycle power plants.

PB-256 766/7GA PC$10.00/MF$3.00
Skidmore, Owings and Merrill, Washington, D.C.
Bonneville Power Administration Electric Energy Conservation Study.
Final rept.
Jun 76, 333p
Contract DI-14-03-6100N

Descriptors: *Energy conservation, Space heating, Hot water heating, Illuminating, Insulation, Electric appliances, School buildings, Schools, Residential buildings, Commercial buildings, Office buildings, Aluminum industry, Paper industry, Chemical industry, Food industry, Metal industry, Irrigation, Industries, Washington(State), Oregon, Idaho, Montana.
Identifiers: Pacific Northwest Region(United States), Residential sector, Commercial sector, Industrial sector.

The potential for conservation to reduce forecasted electric energy needs in the Pacific Northwest is analyzed. The report outlines energy savings and impacts for a variety of conservation strategies. Energy conservation is defined in the study as improving the efficiency of energy use. None of the measures require curtailment of energy-using practices. The potential for conservation in the region ranges from 5 to 33 percent of the 1995 forecast demand.

PB-257 657/7GA PC$4.00/MF$3.00
Colorado Univ., Boulder. Graduate School of Business.
Financial Implications of Retrospective Premium Assessments on Electric Utilities.
Technical rept.,
Ronald W. Melcher. May 76, 33p* NR/AIG-003

Descriptors: *Electric utilities, *Economic analysis, *Public utilities, Nuclear power plants, Energy policy, Assessments, Economic impact, Legislation, Regulations, Cash flow, Return on investment, Risk, Accounting, Forecasting.
Identifiers: Price-Anderson Act, Public Law 94-197, Atomic Energy Act of 1954.

This report examines the present financial condition and capital requirement forecasts of the electric utility industry in terms of the need for

future electric generating capacity. It focuses on recent accounting developments pertinent to accounting for contingencies and the financial impact of retrospective premium assessments on electric utilities. Availability of cash funds to meet retrospective premium obligations is discussed.

10C. Energy Storage

PAT-APPL-576 923/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Electrochemical Formation of Graphite Intercalation Compounds for Storage Batteries.
Patent Application,
Douglas N. Bennion, Ranna K. Hebbar, and Danjay L. Deshpande. Filed 12 May 75, 20p AD-D002 864/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Storage batteries, *Electrodes, Electrochemistry, Performance tests, Lithium perchlorate, Electrolytes.
Identifiers: PAT-CL-136-6, *Patent applications, Lithium graphite fluoride cells, *Graphite fluoride, Design criteria.

This patent application pertains to a positive electrode of a storage battery which is formed by applying an electrical charge through a non-aqueous lithium perchlorate solution to an electrode formed of powdered 'Madagascar'-type graphite and lithium floride.

11. MATERIALS

11B. Ceramics, Refractories, and Glasses

AD-A029 459/5GA PC$4.00/MF$3.00
Aerospace Corp El Segundo Calif Materials Sciences Lab
A System Employing Laser Heating for the Measurement of High-Temperature Thermal Properties Over a Wide Pressure Range.
Interim rept.,
A. Greenville Whittaker, P. L. Kintner, L. S. Nelson, and N. Richardson. 7 Jul 76, 39p TR-0076(6250-11)-2, SAMSO-TR-76-133
Contract F04701-75-C-0076
Prepared in cooperation with Sandia Corp., Albuquerque, N. Mex.

Descriptors: *Carbon, *Test equipment, *High temperature, Carbon dioxide lasers, Refractory materials, Phase studies, Heating, Vapor pressure, Experimental design, Spectroscopy, Pyrometers.
Identifiers: Laser heating, Design, Triple point.

An equipment system is described that can be used to obtain high-temperature physical property data on refractory materials by means of laser heating. Properties that can be measured are: vapor pressure of solid and liquid phases; relative rate of vaporization; and emission spectra from solid and vapor phases. Solid phases can be studied by splat cooling of the liquid and quench cooling of the solid and vapor. Temperature can be measured both pyrometrically and spectroscopically. In addition, the effects produced by heating a material in an atmosphere of controlled composition and pressure can be studied. The equipment system described here was designed to obtain data on the phase behavior of carbon in the 3500 to 4700 K temperature range, a temperature range for which there is no material that can be used to contain carbon to measure vapor pressure, phase transitions, and melting point by the conventional methods. The CO2 laser was used for heating.

AD-A029 660/8GA PC$5.50/MF$3.00
Lehigh Univ Bethlehem Pa Ceramics Research Lab
Thermal Conductivity and Diffusivity of Engineering Ceramics.
Final technical rept. Jun 74-Jun 76,
J. H. Siebeneck, and D. P. H. Hasselman. Aug 76, 104p
Contract N00014-75-C-0760
See also AD-A015 717.

Descriptors: *Ceramic materials, *Thermal conductivity, *Thermal diffusion, Thermal properties, Thermal radiation, Heat transfer, Thermal shock, Shock resistance, Solid solutions, Cracking(Fracturing), Porous materials, Microstructure, Wear resistance, Silicon compounds, Nitrogen compounds, Glass, Carbon, Alumina, Chromium compounds, Oxides, Titanium dioxide, Aluminum compounds, Niobates, Iron compounds, Titanates, Magnesium compounds.
Identifiers: Sialons.

This report summarizes the results of a two-year research program devoted to an investigation of the effect of compositional and microstructural variables on the thermal conductivity/diffusivity and its temperature dependence of structural ceramics. A total of twelve completed studies have resulted from this program, as follows: (1) Effect of Temperature Dependence of Thermal Conductivity on Thermal Stress Resistance of Brittle Materials, In Particular Aluminum Oxide; (2) Effect of Matrix Conductivity on Radiation Heat Transfer Across Pores; (3) The Thermal Diffusivity of Al2O3-Cr2O3 Solid Solutions; (4) Effect of Microcracking on the Thermal Diffusivity of Fe2TiO5; (5) Role of Thermal Diffusivity in the Performance of Ceramic Oxide Cutting-Tool Materials; (6) Thermal Diffusivity of Non-Stoichiometric Titanium-Dioxide; (7) Thermal Diffusivity of Si-Al-O-N Compositions; (8) Thermal Diffusivity of Glassy Carbons; (9) Effect of Micro-cracking on the Thermal Diffusivity of Polycrystalline Aluminum-Niobate; (10) Effect of Micro-cracking on the Thermal Diffusivity of MgTi2O5; (11) Micro-cracking as a Mechanism for Improving Thermal Shock Resistance and Thermal Insulation Properties of Ceramic Materials; (12) The Effect of Microstructure and Composition on the Thermal Diffusivity of Structural Ceramics. (Author)

NTIS/PS-76/0690/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 6. Glassy Carbon (A Bibliography with Abstracts).
Rept. for 1964-May 76,
Mona F. Smith. Sep 76, 52p*
Supersedes NTIS/PS-75/618, and NTIS/PS-75/183.

Descriptors: *Bibliographies, *Carbon, Vitreous state, Crystal structure, Amorphous materials, Polymers, Pyrolysis, Mechanical properties, Porosity, Abstracts.
Identifiers: *Glassy carbon, NTISNTIS.

The research reports describe glassy carbon preparation, structure, properties, composites, and alloys with metals. (This updated bibliography contains 47 abstracts, 4 of which are new entries to the previous edition.)

PAT-APPL-695 298/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Ceramic Compositions.
Patent Application,
William J. McDonough, and Roy W. Rice. Filed 11 Jun 76, 9p AD-D002 883/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Silicon nitrides, *Refractory materials, Additives, Zirconium compounds, Carbides, Silicates, Nitrides.
Identifiers: *Patent applications, Zirconium carbides, Zirconium silicates, Zirconium nitrides, PAT-CL-106-57.

The patent application describes silicon nitride and an additive selected from zirconium carbide, zirconium nitride, zirconium silicate, and mixtures thereof in an amount from 1 to 25 weight percent of the weight of silicon nitride.

PATENT-3 931 392
Not available NTIS
Department of the Navy Washington D C
Enhancement of Ultimate Tensile Strength of Carbon Fibers.
Patent,
Victor R. Deitz. Filed 10 Jan 74, patented 6 Jan 76, 3p AD-D002 892/8, PAT-APPL-432 773
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Carbon fibers, *Patents, Bromine, Tensile strength.
Identifiers: PAT-CL-423-477, *Liquid bromine.

The patent concerns a method of enhancing the tensile strength of carbon fibers of laboratory and commercial materials. Carbon fibers are immersed at ambient temperatures in liquid bromine or bromine dissolved in a solvent within a chemical resistant container for a period of time. The bromine is then removed by flushing with an inert gas. The bromine may be recovered and reused by condensing the vapor; small traces of bromine may remain within the fiber. It has been found that the bromine treatment enhances the tensile strength of the treated fiber.

PB-256 892/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Testing and Test Analysis of MHD-Materials.
Final rept.,
H. P. R. Frederikse, W. R. Hosler, and N. L. Loeffler. 1974, 13p
Prepared in cooperation with Tennessee Univ. Space Inst., Tullahoma. Pub. in Proceedings of NSF-OCR Engineering Workshop on MHD-Materials, Cambridge, Mass. November 20-22, 1974, p138-149 1974.

Descriptors: *Magnetohydrodynamic generators, *Materials, *Performance tests, Refractory materials, Electrodes, High temperature tests, Slags.

The problem of materials development for MHD-power generation is two-fold: the materials to be used in the channel, the combuster, the air-preheater, etc. must have the appropriate electrical and thermal characteristics and at the same time possess sufficient mechanical strength and chemical stability to withstand the very severe environmental conditions for periods of 1000 - 10,000 hours. This paper discusses the test conditions in small and medium sized MHD-generators and evaluates the tested materials. The results of two short tests performed on 4 electrode materials in the UTSI-MHD-facility are described and the conclusions drawn from these tests are summarized.

PB-256 894/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Emerging Priorities in Ceramic Engineering and Science - Viewpoint of the Scientist-Engineer.
Final rept.,
John B. Wachtman, Jr. 1974, 15p

Pub. in Proceedings of Conference on Emerging Priorities in Ceramic Engineering and Science, Alfred, N.Y., November 4-6, 1974. Paper in Ceramic Engineering and Science, p37-50 1974.

Descriptors: *Ceramics, *Personnel development, Industrial engineering, Research, Specialized training, Scientists, Engineers, Meetings, Technology transfer.

The role of the scientist-engineer regarding application of technology to national problems is discussed. The probable physical and social 'environment' of the future scientist-engineer is assessed. Promising areas of ceramic science are discussed in broad terms. Some educational priorities are recommended.

PB-256 896/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Crack Morphology in Relatively Brittle Crystals.
Final rept.,
Robb Thomson, and Edwin Fuller. 1973, 13p
Pub. in Proceedings of Symposium on Fracture Mechanics of Ceramics, University Park, Pa., July 11-13, 1973. Paper in Fracture Mechanics of Ceramics, v1 p283-295 1973.

Descriptors: *Fractures(Materials), *Ceramic materials, Crystal structure, Ductility, Brittleness, Crack propagation, Stress corrosion.

From the viewpoint that cracks are atomically sharp, general outlines are given for some of the types of theories which should be developed for such cracks. The existence of atomic cleavage in a large class of materials is argued on the basis of the stability of a crack under spontaneous dislocation formation. A qualitative description of lattice trapping of a cleavage crack is given which correlates the effect to the atomic force laws. The determining factor for the observation of lattice trapping is the width of the cohesive region of the crack 'core.' Finally, a qualitative model of slow crack growth due to environmental effects is developed in terms of atomic dissolution at the crack tip.

11C. Coating, Colorants, and Finishes

PB-256 931/7GA PC$5.00/MF$3.00
Clemson Univ., S.C. Div. of Interdisciplinary Studies.
Water Resistant Polymer Coatings for Water Soluble Glass Packaging Containers. Progress Report No. 4. Design and Evaluation of a Water Disposable Glass Packaging Container.
Master's thesis,
Donald A. Kay. May 71, 81p
Grant PHS-EC-00033

Descriptors: *Glass, *Containers, *Bottles, *Waterproof coatings, *Polymers, Solid waste disposal, Protective coatings, Adhesion, Surface finishing, Chemical resistance, Sodium silicates, Theses.
Identifiers: *Solid waste abatement, *Water soluble glass, Beverage containers.

The principal objective of this research was to develop a water resistant protective coating in order to render water soluble glass suitable for utilization as a container structure. Two alternative approaches can be used to apply such coatings: (1) apply an inorganic coating (this is currently being done in another research group using vapor deposition methods), or (2) apply an organic or polymer coating. The research described here deals with the development of the latter approach. The final coated structure might be employed as a container for such items as soft drinks, beer, food, detergents, etc.

PB-257 194/1GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Architectural Glazing Safety Standard: Survey of Codes and Standards.
Final rept.,
Sanford C. Adler. Jun 76, 65p NBSIR-76-1109
Sponsored in part by Consumer Product Safety Commission, Bethesda, Md.

Descriptors: *Standards, *Safety engineering, *Glazes, *Product safety, Windows, Doors, Transparent panels, Mechanical tests, Hazards, Coding, Consumer affairs, Surveys, Reviews, Legislation, Environmental tests, Impact tests, Loads(Forces), Elastic properties, Regulations, Government policies, Residential buildings.
Identifiers: Bathtub enclosures.

The report describes 34 test procedures extracted from 97 codes and standards identified in an extensive library search of English language codes and standards relating to architectural glazing. The report also contains summaries of existing state laws relating to safety glazing. Test descriptions include procedures, kinetic energy levels, purpose of tests, and acceptance/rejection criteria. Test methods, codes and standards, and sources are cross-referenced.

11D. Composite Materials

AD-A029 206/0GA PC$4.00/MF$3.00
Watervliet Arsenal N Y
Filament Winding of Surfaces of Revolution.
Technical rept.,
Royce W. Soanes, Jr. Aug 76, 26p Rept no. WVT-TR-76032

Descriptors: *Composite materials, *Filament wound construction, *Differential geometry, *Winding, Rotation, Bodies of revolution, Pressure vessels, Calculus of variations.
Identifiers: Winding machines, Surfaces of revolution, Filament winding.

A method for defining 'locally geodesic' curves on surfaces of revolution is given here for the purpose of accommodating practical filament winding situations where one may be able to depart from a pure geodesic due to the presence of surface friction. This departure may be necessary when winding odd shapes and it may also be desirable for the purpose of making a trade off between hoop and longitudinal stiffness of the filament wound composite. An analytical (as opposed to manual) calibration of a traversing-rotating filamentary winding machine is also included. (Author)

AD-A029 674/9GA PC$4.00/MF$3.00
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
Mechanics of Composite Materials.
Final rept. 1 Jul 70-30 Jun 76,
G. A. Hegemier. 1976, 39p AFOSR-TR-76-1069
Grant AF-AFOSR-2870-75
Continuation of Grant AF-AFOSR-1957-70.

Descriptors: *Composite materials, Wave propagation, Failure(Mechanics), Diffusion.

The report summarizes the results of a theoretical study of wave propagation, diffusion, and damage accumulation in composite materials.

NTIS/PS-76/0685/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 1. Carbon and Graphite Fibers and Fiber Composites. Volume 2. 1974-July 1976 (A Bibliography with Abstracts).
Rept. for 1974-Jul 76,
Mona F. Smith. Sep 76, 247p*
Supersedes NTIS/PS-75/613, and COM-74-11526.

Descriptors: *Bibliographies, *Composite materials, *Carbon fibers, Graphite, Reinforced plastics, Polymers, Mechanical properties, Carbonization, Temperature, Tests, Abstracts.
Identifiers: *Graphite reinforced composites, *Carbon reinforced composites, *Graphite fibers, NTISNTIS.

Most of these studies involve the use of carbon and graphite reinforcing fibers in composite materials particularly metal and plastic matrix composites. Also included are fiber and fiber reinforced composite studies concerning fabrication, mechanical properties, heat resistance and formation from organic polymers. (This updated bibliography contains 241 abstracts, 82 of which are new entries to the previous edition.) See also NTIS/PS-75/612 which is Vol. 1 covering 1964-1973.

NTIS/PS-76/0686/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Carbon and Graphite. Part 2. Carbon and Graphite Composites (Excluding Fiber Composites) (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Mona F. Smith. Sep 76, 154p*
Supersedes NTIS/PS-75/614, and COM-74-11527.

Descriptors: *Bibliographies, *Composite materials, Carbon, Graphite, Mechanical properties, Thermal resistance, Fabrication, Ablative materials, Oxidation resistance, Abstracts.
Identifiers: *Graphite matrix composites, *Carbon matrix composites, NTISNTIS.

Reports on carbon or graphite composites which are not specifically concerned with carbon or graphite fibers are cited. This includes studies on non-fiber carbon reinforcement, carbon or graphite matrix composites, applications, properties, fabrication, and structural analysis. The majority of research concerns aircraft components and ablative materials for rockets. (This updated bibliography contains 154 abstracts, 14 of which are new entries to the previous edition.)

11E. Fibers and Textiles

PB-256 991/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Ranking Extinguishability of Burning Fabrics.
Final rept.,
John F. Krasny, and James B. Francis. Jun 74, 4p
Pub. in Jnl. of Am Ass. Text Chem. Color, v6 n6 p135-136 Jun 74.

Descriptors: *Fabrics, *Flammability, Burning rate, Extinguishing, Fire protection, Hazards, Tests, Cotton fabrics, Polyester fibers, Combustion, Clothing.
Identifiers: Reprints.

The report describes initial efforts to obtain laboratory data on the relative extinguishability of various fabrics, an aspect of the hazard due to burning fabrics which has been largely neglected in the past. A simple apparatus was designed to simulate the extinction of burning fabrics by beating the flames out. Two plates covered with asbestos sheeting are brought together at a rapid rate after a fabric suspended between them comes to a full burn. The time the plates have to be held together to extinguish the flames was found to increase roughly with increasing fabric weight. For a given weight, the time to extinguish tended to be shorter for all-cotton fabrics than for polyester/cotton blends; the blends also tended to stick to the plates.

11F. Metallurgy and Metallography

AD-A029 135/1GA PC$4.00/MF$3.00
Aerospace Corp El Segundo Calif Materials Sciences Lab
The Measurement of Dimensional Stability of Invar Using Strain-Gage Techniques.
Final rept.,
E. G. Wolff, and C. S. Susskind. 9 Aug 76, 42p
TR-0076(6950-07)-4, SAMSO-TR-76-186
Contract F04701-75-C-0076

Descriptors: *Iron alloys, Nickel alloys, Stability, Mechanical properties, Strain gages, Measurement.
Identifiers: Dimensional stability, Iron alloy Invar, Iron alloy 36Ni.

The use of Micro-Measurements Type WK-00 strain gates for the measurement of the room-temperature dimensional stability of Invar was investigated. One-half inch diameter Invar rods (0.05% C, 36.2% Ni) were subjected to four heat treatments, which had been reported to produce highly stable Invar components. Microstrain measurement system capabilities are outlined in terms of resolution and stability. Detection of plus or minus 0.2 counts per microstrain strain instabilities after 1000 hr is possible with sufficient consideration of adhesives, bridge components, and measurement laboratory temperature stability.

AD-A029 196/3GA PC$4.50/MF$3.00
Picatinny Arsenal Dover N J
A Chromate-Free Process for Preparing Aluminum Substrates for Adhesive Bonding -- A Preliminary Study.
Technical rept.,
William J. Russell. Jul 76, 57p Rept no. PA-TR-4861

Descriptors: *Aluminum alloys, *Etching, *Adhesive bonding, Electron microscopy, Electrochemistry, Surface finishing, Nitric acid, Sodium sulfates.
Identifiers: Aluminum alloy 2024, Aluminum alloy 6061, Iron sulfates.

A new, non-chromated etchant for preparation of aluminum surfaces for adhesive bonding has been developed. The standard chromated sulfuric acid (FPL) treatment of aluminum alloy surfaces for adhesive bonding was studied using etching rate determinations, electrochemical monitoring of the reaction, surface resistance measurements, and transmission electron microscopy. The results of these studies were used to develop the new etchant. Limited tests were conducted using a thermosetting film adhesive to bond specimens prepared with a new, non-chromated etchant on two different aluminum alloys, 2024-T3 and 6061-T4. These were subjected to hot water soak and stressed durability testing. These preliminary tests indicate that the new etchant composition resulted in joints with bond strength and short term durability essentially equal to those produced using the standard chromated etchant. The new etchant consisted of an aqueous solution of nitric acid, sodium sulfate, and ferric sulfate.

AD-A029 374/6GA PC$4.00/MF$3.00
Rensselaer Polytechnic Inst Troy N Y School of Engineering
Kinetics of the Martensite Transformation in Athermal Fe-C-Ni-Cr Alloys.
Technical rept.,
R. Pradhan, and G. S. Ansell. Jul 76, 44p Rept no. TR-7
Contract N00014-76-C-0458

Descriptors: *Carbon steels, *Martensite, *Phase transformations, *Austenite, Nickel, Chromium, Deformation, Thermodynamics.

An investigation was conducted to study the martensite transformation kinetics of athermal Fe-C-Ni-Cr alloys. The transformation rate was found to be dependent on alloy composition and was a function of (1) the rate of change of chemical free energy with temperature, and (2) the energy expended in deforming the austenite surrounding a growing martensite embryo in order to accommodate the transformational volume and shear strains. Increasing either of these two factors leads to an increase in transformation rate. Also, it was found that the magnitude of the contribution of the deformation energy to the overall nonchemical free energy associated with the transformation depends on the alloy system and specific composition. (Author)

AD-A029 427/2GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Effect of Section Size on the Fatigue Crack Growth Rate of A516-60 Pressure-Vessel Steel.
Final rept.,
A. M. Sullivan, and T. W. Crooker. 4 Aug 76, 16p Rept no. NRL-8004

Descriptors: *Steel, *Crack propagation, *Pressure vessels, Sizes(Dimensions), Thickness, Regression analysis.
Identifiers: Steel A-516.

Studies of the fatigue crack growth rate of A516-60 pressure-vessel steel indicate no section-size effect in stress-relieved specimens ranging in thickness from 6.35-50.8 mm (0.25 to 2.0 in.). A regression curve equation for all thicknesses, relating cyclic crack growth rate (da/dN) to crack-tip stress-intensity factor range (delta K) is obtained. The significance of these results is discussed in the light of current engineering practice and of previous studies of size effects in fatigue crack propagation. (Author)

AD-A029 436/3GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Inherent Corrosion Resistance and Response to Cathodic Protection in Seawater of Recently Developed Stainless Steel Alloys.
Final rept.,
T. J. Lennox, Jr., and M. H. Peterson. 4 Aug 76, 24p Rept no. NRL-8016

Descriptors: *Stainless steel, *Cathodic protection, *Corrosion resistant alloys, *Corrosion resistance, *Sea water corrosion, Corrosion, Sea water, Electrochemistry, Anodes, Zinc, Steel.
Identifiers: Crevice corrosion, Steel 216, Steel 20Cr 6.5Mo 24Ni, Steel 26Cr 1Mo, Steel 22Cr 5Mn 13Ni.

Stainless steel alloys (24Ni-20Cr-6.5Mo, 26Cr-1M0, 22Cr-13Ni-5Mn, and Type 216 stainless steel) werre studied for inherent corrosion resistance in quiescent and slowly moving seawater. The response of these alloys to two levels of cathodic protection (mild steel and zinc anodes) was also studied. None of the alloys was completely resistant to corrosion. Most were quite susceptible to crevice corrosion, but two unprotected specimens of 24Ni-20Cr-6.5Mo stainless steel had excellent resistance in both exposure conditions. These specimens exhibited relatively noble freely corroding electrochemical potentials over an extended period. Cathodic protection with either mild steel (Fe) or zinc (Zn) anodes prevented crevice corrosion, but the 26Cr-1Mo and 22Cr-13Ni-5Mn stainless steels showed some edge corrosion and corrosion under the mild steel anode, respectively, when polarized to the potential of mild steel. (Author)

PB-256 574/5GA PC$5.50/MF$3.00
Singmaster and Breyer, New York.
Nickel Recovery from Western Sources. Task I - Report - Technical and Economic Evaluation.
Dec 75, 123p BuMines-OFR-65-76
Contract DI-J0255007

Descriptors: *Nickel ores, *Extractive metallurgy, *Laterites, Cobalt, Drying, Roasting, Reduction(Chemistry), Leaching, Separation, Ammonium sulfate, Solvent extraction, Electrowinning, Design, Pilot plants, Operating costs, Capitalized costs.

The Albany Metallurgical Research Center of the U.S. Bureau of Mines has developed a conceptual process for the extraction and recovery of nickel and cobalt from Western laterites. The process steps, in sequence, include drying, calcination and controlled reduction of the ore, selective oxidation and leaching of the reduced ore in ammoniacal ammonium sulfate solutions, separation of leach residues from pregnant liquor, selective solvent extraction of metals from leach solutions onto organic solvents and selective stripping of metals from the solvents into recycled electrolytes, and electrowinning the metal products from the stripping solution. The process steps have been demonstrated on a semicontinuous bench scale in the laboratory, and guide lines are provided for selection of criteria on which the design of a commercial size plant can be based and plant costs estimated.

PB-257 169/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The Effect of the Anisotropy of Surface Tension and Interface Kinetics on Morphological Stability.
Final rept.,
S. R. Coriell, and R. F. Sekerka. 14 Oct 75, 10p
Prepared in cooperation with Carnegie-Mellon Univ., Pittsburgh, Pa., Contract NSF-DMR75-09477. Pub. in Jnl. of Crystal Growth, v34 n2 p157-163 Jul 76.

Descriptors: *Alloys, *Solidification, *Morphology, *Crystal growth, Anisotropy, Interfaces, Reaction kinetics, Surface tension, Mathematical analysis, Dendritic crystals.
Identifiers: Reprints.

The theory of the morphological stability of a planar interface during solidification of a binary alloy has been modified to account for an anisotropic departure from local equilibrium (anisotropic interface kinetics) at the solid-liquid interface. Allowance for anisotropy of surface tension causes the capillary terms to depend on direction. Anisotropic interface kinetics leads to the additional important effect that sinusoidal perturbations are translated parallel to the unperturbed interface as they change in amplitude. The peaks of such sinusoidal perturbations will therefore grow at an angle to the normal of the unperturbed interface. This effect is believed to be an underlying cause for the existence of preferred directions for cellular and dendritic growth.

PB-257 191/7GA PC$3.50/MF$3.00
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
Stacking Fault Energies of fcc Fe-Ni Alloys by X-Ray Diffraction Line Profile Analysis.
Final rept.,
Raymond E. Schramm, and Richard P. Reed. 6 May 75, 6p
Pub. in Metallurgical Transactions A, v7A p359-363 Mar 76. Prepared in cooperation with California Univ., Livermore, Lawrence Livermore Lab.

Descriptors: *Iron alloys, *Nickel alloys, *Crystal defects, X ray diffraction, Twinning, Face centered cubic lattices, Intermetallic compounds, Order disorder transformations, Lattice parameters.

Identifiers: Reprints, *Stacking fault energy, Iron intermetallics, Nickel intermetallics.

The stacking fault energies of the fcc alloy series Fe-28 Ni to pure Ni were investigated using x-ray diffraction line profile analysis. A minimum stacking fault energy of about 70 mJ/sq m occurs at the approximate composition of Fe 40Ni. From this point, the lower nickel alloys rapidly increase to a very high stacking fault energy, estimated to be 200 mJ/sq m, while the energies of the high Ni alloys rise linearly to the Ni value of 214 mJ/sq m. Anomalous reductions of the lattice parameter after cold work were found for the low nickel alloys; this was interpreted as evidence for Fe3Ni ordering and corrections to the stacking fault energy were made.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A029 267/2GA PC$5.50/MF$3.00
Battelle Columbus Labs Ohio
Aircraft Propulsion Lubricating Film Additives: Boundary Lubricant Surface Films.
Final rept. 1 Dec 74-30 Apr 76,
C. M. Allen, E. Drauglis, W. A. Glaeser, C. A. Alexander, and R. J. Jakobsen. May 76, 119p
AFAPL-TR-73-121-Vol-3
Contract F33615-73-C-2026
See also report dated Jan 75, AD-A008 530.

Descriptors: *Lubricants, *Boundary layer, *Aircraft equipment, Lubricant additives, Bearings, Machines, Lubricating oils, Laboratory tests, Mechanical properties, Infrared spectroscopy, Hydrocarbons, Esters, Ellipsometers, Creep, Iron, Copper, Chromium, Molecular structure, Orientation(Direction), Stearic acid, Adsorption, Friction, Shear properties, Thermal properties, Surface chemistry, Rheology, Damping.
Identifiers: FMIR spectroscopy, Frustrated multiple internal reflection, Polarized electromagnetic radiation.

The report summarizes the research prior to that described in Volume III and presents the results of the most recent research in some detail. This covers a broad spectrum of data on mechanical properties, using a sensitive stick-slip friction apparatus; the detection of molecular order and orientation in quiescently formed solution films using frustrated-multiple-internal-reflection infrared spectroscopy (FMIR), and in the determination of the thermodynamic properties of selected film species using ellipsometric techniques. Experiments were performed on rubbed stearic acid films on three substrates--iron, chromium and copper. Using carefully controlled surface contact conditions, very pure iron and chromium substrates were used to form surface films from straight-chain hydrocarbon solutions and ester-commercial additive systems. The mechanical properties - friction, shear stress and damping- were studied utilizing films formed in situ. This is also true for the measurement of thermodynamic properties though no dynamic rubbing contact was involved in the ellipsometric determinations.

NTIS/PS-76/0734/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solid Lubricants (Citations from the NTIS Data Base).
Rept. for 1964-Aug 76,
William E. Reed. Sep 76, 166p*
Supersedes NTIS/PS-75/715, and NTIS/PS-75/113. See also NTIS/PS-76/0735, and NTIS/PS-76/0736.

Descriptors: *Bibliographies, *Solid lubricants, Molybdenum sulfides, Polymeric films, Graphite, Bearings, Thin films, Performance evaluation, Physical properties, Plastics, Lubrication.
Identifiers: Graphite fluorides, Molybdenum disulfides, Dry films.

The research covers the preparation, applications, properties, and testing of solid lubricants. Molybdenum disulfide, polymer films, graphite fluoride are but a few of the materials covered. (This updated bibliography contains 161 abstracts, 33 of which are new entries to the previous edition.)

NTIS/PS-76/0735/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solid Lubricants. Part 1. Molybdenum Compounds (Citations from the Engineering Index Data Base).
Rept. for 1970-Aug 76,
William E. Reed. Sep 76, 142p*
See also NTIS/PS-76/0734.

Descriptors: *Bibliographies, *Solid lubricants, Molybdenum compounds, Molybdenum sulfides, Lubrication, Lubricant additives, Films, Performance.

Worldwide research reports are cited which cover the preparation, applications, properties, and testing of molybdenum compound solid lubricants. Includes discussions of applications in the metal working, aerospace, and automotive industries. (Contains 135 abstracts) See also NTIS/PS-76/0736, Solid Lubricants. Part 2. Graphite, Polymers, Fluorides, and General Studies.

NTIS/PS-76/0736/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solid Lubricants. Part 2. Graphite, Polymers, Fluorides, and General Studies (Citation from the Engineering Index Data Base).
Rept. for 1970-Aug 76,
William E. Reed. Sep 76, 156p*
See also NTIS/PS-76/0734.

Descriptors: *Bibliographies, *Solid lubricants, Graphite, Polymeric films, Plastics, Fluorides, Lubrication, Tetrafluoroethylene resins, Lead, Films, Performance.
Identifiers: Dry films.

Worldwide research reports are cited which cover the preparation, applications, properties, and testing of solid lubricants. Applications include bearings, gears, metal forming and cutting, and high and low temperature usage. (Contains 149 abstracts) See also NTIS/PS-76/0735, Solid Lubricants. Part 1. Molybdenum Compounds.

11I. Plastics

PB-256 918/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Concepts and Trends in Polymer Fire Testing.
Final rept.,
Marts Meisters. Sep 75, 6p
Pub. in Modern Plastics, v52 n9 p76-78, 81-82 Sep 75.

Descriptors: *Flammability testing, *Plastics, Ignition, Heat transfer, Smoke generators, Heat of combustion, Laboratory equipment.
Identifiers: Reprints, Baseline measurements, *ASTM D 1692.

This report provides a framework for understanding the principles that are important in correlating small- and large-scale fires by describing a selected series of small-scale tests in terms of such fire concepts as ignition, propagation, heat release, and smoke generation. All of the methods have limitations and cannot completely evaluate fire performance, but they offer a baseline for continued development of tests to provide better correlations with real-fire performance.

11L. Wood and Paper Products

AD-A029 258/1GA PC$5.50/MF$3.00
Naval Research Lab Washington D C
Proceedings of a Workshop on the Biodeterioration of Tropical Woods: Chemical Basis for Natural Resistance Held at Naval Research Laboratory, Washington, D.C. on October 17-18, 1974,
John D. Bultman. Jul 76, 102p

Descriptors: *Wood, *Biodeterioration, *Tropical regions, *Meetings, Resistance(Biology), Chemical reactions, Biocides, Marine borers, Fungicides, Inhibition, Oxidation, Melanin, Response(Biology), Termites, Mollusca, Phenols, Polycyclic compounds, Cooling towers, Quinones.

Contents:
- Research at the Naval Research Laboratory on Bioresistant tropical woods: An Overview;
- Biocides from Marine borer resistant timbers;
- Dalbergia polyphenols and shell formation in mollusks: Preliminary results;
- Search for a 'Weak Link';
- The performance of Dalbergia wood and Dalbergia Extractives impregnated into pine and exposed in a water cooling tower;
- Inhibition of fungal growth and reproduction by obtusaquinone and some cinnamylphenols;
- Resistance of tropical woods to subterranean termites;
- Responses of the Formosan Subterranean Termite to tropical wood extracts;
- Field evaluation of natural wood extractives and some related compounds as antiborer agents;
- Comments on Melanin and polyphenoloxidase inhibitors.

PB-256 682/6GA PC$4.00/MF$3.00
North Central Forest Experiment Station, St. Paul, Minn.
Pulpwood Production in the North Central Region by County, 1974.
Forest Service resource bull.,
James E. Blyth, and Jerold T. Hahn. 1976, 34p
FSRB-NC-29

Descriptors: *Pulpwood, Trends, Production, Wood pulp, Forest land, Surveys, Residues, Wood wastes, Structural timber, Paper products, Classifications, Volume, United States, Tables(Data).
Identifiers: North Central Region(United States), Central Region(United States), Great Lakes Region(United States).

The report discusses 1974 pulpwood production and receipts and recent production trends in the Lake States and Central States. It gives pulpwood production in the Lake States by species for each county, and compares production by forest survey unit with that of previous years. For the Central States, it presents 1974 pulpwood production and receipt data by state, and shows four production classes by county.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A029 130/2GA PC$4.00/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Analysis of the Binary Euclidean Algorithm,
Richard P. Brent. Jun 76, 37p
Contract N00014-76-C-0370, Grant NSF-MCS75-222-55
Prepared in cooperation with Australian National Univ., Canberra.

Descriptors: *Binary arithmetic, *Algorithms, Iterations, Distribution functions, Theorems.

In this paper the author analyzes a continuous model of the binary algorithm and finds the expected number of iterations. The results agree with the observed behavior of the algorithm much better than those predicted by Knuth's 'lattice-point' model.

AD-A029 134/4GA PC$3.50/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
The Mean Distance in 2-Space,
G. Yuval. Jun 76, 15p
Contract N00014-76-C-0370, Grant NSF-MCS75-222-55

Descriptors: *Complex variables, *Computations, Algorithms, Approximation.
Identifiers: Riemann surfaces.

An O(N squared) lower bound is proven for the mean distance between N points in 2-space, using methods from complex function theory; but if any finite error is allowed, an O(N log N) algorithm is shown for computing the mean distance to within that finite error.

AD-A029 176/8GA PC$3.50/MF$3.00
Wisconsin Univ Madison Dept of Industrial Engineering
Confidence Intervals in Discrete Event Simulation: A Comparison of Replication and Batch Means.
Technical rept.,
Averill M. Law. Aug 76, 25p Rept no. TR-76-13
Contract N00014-76-C-0403

Descriptors: *Stochastic processes, Computerized simulation, *Confidence limits, Comparison, Observation, Probability, Models, Optimization.
Identifiers: Replication, Batch means.

Suppose that one has enough computer time to make n observations of a stochastic process by means of simulation and would like to construct a confidence interval for the steady-state mean. One can make k independent runs of m observations each (n=k.m) or, alternatively, one run of n observations which one then divides into k batches of length m. These methods are known as replication and batch means, respectively. In this paper, using the probability of coverage and the half length of a confidence interval as criteria for comparison, the author empirically shows that batch means is superior to replication, but that neither method works well the author n is too small. He also shows that if m is chosen too small for replication, then the coverage may decrease dramatically as the total sample size n is increased. (Author)

AD-A029 245/8GA PC$3.50/MF$3.00
North Carolina Univ At Charlotte Dept of Mathematics
Optimality of the One Step Look-Ahead Stopping Times.
Technical rept.,
M. Abdel-Hameed. Jul 76, 15p
Contract N00014-76-C-0840, Grant AF-AFOSR-2999-76

Descriptors: *Markov processes, *Statistical functions, Probability distribution functions, Random variables, Theorems, Stochastic processes.
Identifiers: Stopping rules(Mathematics).

No abstract available.

AD-A029 259/9GA PC$3.50/MF$3.00
George Washington Univ Washington D C Inst for Management Science and Engineering
On Computing the Positive Part and a Direction of Negative Curvature for a Symmetric Matrix Given in Dyadic Form,
Garth P. McCormick. 8 Jul 76, 19p Rept no. Serial-T-337
Contract N00014-75-C-0611

Descriptors: *Matrices(Mathematics), *Computations, Eigenvectors, Optimization.
Identifiers: Newton method, Hessian matrices, Eigenvalues, Unconstrained optimization.

The positive part of a symmetric indefinite matrix is that associated with its positive eigenvalues. An iterative procedure is presented for computing an approximation to this and also for computing a direction of negative curvature when the matrix is given as the sum of dyads.

AD-A029 280/5GA PC$3.50/MF$3.00
Desmatics Inc State College Pa
When Ridge Analysis of Response Surfaces Fails.
Technical rept.,
Dennis E. Smith. Aug 76, 13p Rept no. TR-106-2
Contract N00014-75-C-1054

Descriptors: *Response surface analysis, *Matrices(Mathematics), Optimization.
Identifiers: *Ridge analysis.

The method of ridge analysis may be used in connection with a fitted second order response surface when the objective is the location of optimum conditions. This report establishes necessary and sufficient conditions under which application of ridge analysis fails.

AD-A029 286/2GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
A New Principle for Fast Fourier Transformation.
Journal article,
Charles M. Rader, and Norman M. Brenner. 7 Jul 75, 4p JA-4538, ESD-TR-76-192
Contract F19628-73-C-0002
Availability: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, p264-266 Jun 76.

Descriptors: *Fourier transformation, *Fast Fourier transforms, Algorithms, Multiplication.

An alternative form of the fast Fourier transform (FFT) is developed. The new algorithm has the peculiarity that none of the multiplying constants required are complex - most are pure imaginary. The advantages of the new form would, therefore, seem to be most pronounced in systems for which multiplications are most costly. (Author)

AD-A029 287/0GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
More A1E + EA2 = -D and X = A1X + XA2 + D,X(0) = C.
Journal article,
Richard T. Lacoss, and Anthony F. Shakal. 28 Oct 75, 3p JA-4562, ESD-TR-76-193
Contract F19628-73-C-0002, ARPA Order-512
Availability: Pub. in IEEE Transactions on Automatic Control, p405-406 Jun 76.

Descriptors: *Eigenvectors, *Matrices(Mathematics), *Matrix theory, Transformations(Mathematics), Algorithms, Differential equations, Machine coding, Solutions(General), Reprints.
Identifiers: *Eigenvalues.

Finding eigenvalues and eigenvectors of the A sub i and the inverse of the T sub i, if required, are not computationally trivial problems. However, they are common problems for which good programs exist at most scientific computer installations.

AD-A029 295/3GA PC$3.50/MF$3.00
North Carolina Univ At Chapel Hill Dept of Statistics
On Band Limited Stochastic Processes,
Alan J. Lee. 22 Feb 74, 11p AFOSR-TR-76-0915
Grant AF-AFOSR-2386-72
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v30 n2 p269-277 Mar 76.

Descriptors: *Stochastic processes, Polynomials, Covariance, Sampling, Theorems, Limitations, Reprints.

Using a modification of a technique of Zakai, the notion of a band limited stochastic process is extended to the class of second order measurable mean square continuous processes whose covariances are polynomially bounded. The connections between such processes and a class of processes considered by Piranashvili are explored and these two classes are shown to be essentially the same. Such processes are shown to satisfy a modified form of the sampling theorem, have representations in terms of harmonizable processes, and admit orthogonal series representations with band limited coefficient functions. (Author)

AD-A029 297/9GA PC$3.50/MF$3.00
Tennessee Univ Knoxville Dept of Computer Science
Regular Splittings and the Discrete Neumann Problem,
R. J. Plemmons. 20 Aug 74, 10p ARO-11755.3-M
Contract DAHC04-74-C-0019
Availability: Pub. in Numerisch Mathematik, v25 p153-161 1976.

Descriptors: *Iterations, *Approximation(Mathematics), Linear systems, Matrices(Mathematics), Theorems, Reprints.
Identifiers: *Discrete Neumann problem.

Iterative methods are discussed for approximating a solution to a singular but consistent square linear system Ax=b. The methods are based upon splitting A=M-N with M nonsingular. Monotonicity and the concept of regular splittings, introduced by Varga, are used to determine some necessary and some sufficient conditions in order that the iteration x to the i+1 power = N x to the i power/M + b/M converge to a solution to the linear system. Finally, applications are given to solving the discrete Neumann problem by iteration which are based upon the inherent monotonicity in the formulation.

AD-A029 337/3GA PC$3.50/MF$3.00
Syracuse Univ N Y Dept of Industrial Engineering and Operations Research
An Equivalence between Continuous and Discrete Time Markov Decision Processes.
Interim rept.,
Richard F. Serfozo. Jun 76, 20p AFOSR-TR-76-1056
Grants AF-AFOSR-2627-74, NSF-ENG-75-13653

Descriptors: *Markov processes, *Statistical decision theory, Time dependence, Cost analysis, Industrial research.
Identifiers: Continuous time decision processes, Discrete time decision processes.

A continuous time Markov decision process with bounded sojourn parameters (the parameters of the exponential sojourn times in the states) is shown to be equivalent to a simpler discrete time Markov decision process. This is for both the discounted and average cost criteria on an infinite horizon. This result follows from (1) an equivalence of certain functionals of equivalent Markov processes, and (2) the property that a continuous time jump Markov process with bounded sojourn parameters is equal in distribution to a similar Markov process whose sojourn parameters are all the same. (Author)

AD-A029 442/1GA PC$5.50/MF$3.00
Northwestern Univ Evanston Ill Dept of Industrial Engineering and Management Sciences
Contributions to the Theory of Mass Screening.
Technical rept.,
John A. Voelker. Jun 76, 118p Rept no. TR-2
Contracts N00014-67-A-0356-0030, N00014-75-C-0797
Thesis.

Descriptors: *Population(Mathematics), *Sampling, Reliability, Markov processes, Random variables, Theorems, Theses.
Identifiers: SemiMarkov processes, *Screening experiments, *Mass screening.

Consider a population (composed, for example, of people, machines, or livestock) subject to a randomly occurring defect or disease. If there exist testing procedures capable of detecting the defect before it would otherwise become know, and if such early detection provides benefit, the periodic administration of such a test procedure to the members of the population, i.e., a mass screening program, may be advisable. This thesis develops and analyzes two analytical models of a mass screening program. In both models, the defect arrival process is Poisson and the ability of the test to recognize a defect is not, in general, assumed perfect. The first model represents the evolution of the defect, once it occurs, as a semi-Markov process. Both the test reliability and the detection payoff are dependent upon the state of that process. The second model is structurally simpler, focusing on the time since incidence of a defect as the factor which determines the relability of a test administration and the value of a detection.

AD-A029 450/4GA PC$4.50/MF$3.00
University of Southern California Los Angeles Dept of Psychology
The Analysis of Dominance Matrices: Extraction of Unidimensional Orders within a Multidimensional Context.
Technical rept.,
Thomas J. Reynolds. Jun 76, 73p Rept no. TR-3
Contract N00014-75-C-0684

Descriptors: *Factor analysis, *Matrices(Mathematics), *Mathematical logic, Boolean algebra, Computations.
Identifiers: Psychometrics, Axioms, ERGO method.

A method of factor extraction specific to a binary matrix, illustrated here as a person-by-item response matrix, is presented. The extraction procedure, termed ERGO, differs from the more commonly implemented dimensionalizing techniques, factor analysis and multidimensional scaling, by taking into consideration item difficulty. The ERGO procedure uses the calculation of a dominance matrix which, for either persons or items, has the important attribute of allowing directionality to be inferred between relations.

AD-A029 492/6GA PC$3.50/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
An Evaluation of Exponential and Weibull Test Plans.
Journal article,
H. Leon Harter, and Albert H. Moore. 18 Sep 75, 6p
Availability: Pub. in IEEE Transactions on Reliability, vR-25 n2 p100-104 Jun 76.

Descriptors: *Weibull density functions, Reliability, Test methods, Monte Carlo method, Exponential functions, Decision theory, Risk, Reprints.

MIL-STD-781B gives sampling plans (sequential and fixed length) for reliability tests under the assumption of a constant failure rate. Using Monte Carlo techniques, the authors compare s-expected time to a decision and producer and consumer risks for some of these plans. It is shown that plans which assume an exponential distribution are not robust to departures from that assumption. A simple modification of these plans for use when life has a Weibull distribution with known shape parameter not equal to one, and an adaptive test procedure for use when life has a Weibull distribution with unknown shape parameter are proposed. The modified plans for a Weibull distribution with known shape parameter have the same designated producer and consumer risks, but different s-expected time to a decision than the corresponding exponential plans. Using Monte Carlo techniques, the authors determine s-expected time to a decision and producer and consumer risks for various forms of the adaptive procedure. (Author)

AD-A029 503/0GA PC$4.00/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
The Method of Least Squares and Some Alternatives. Part I.
Journal article,
H. Leon Harter. 1974, 29p
Summary in French. See also Part 2, AD-A092 504.
Availability: Pub. in International Statistical Review, v42 n2 p147-174 Aug 74.

Descriptors: *Least squares method, Statistics, Linear regression analyses, Regression analysis, Errors, Variables, Standard deviation, Estimates, Equations, Reprints.

A very important problem in mathematical statistics is that of finding the best linear or non-linear regression equation to express the relation between a dependent variable and one or more independent variables. Given are observations, each subject to random error, greater in number than the parameters in the regression equation, on the dependent variable and the related values of the independent variable(s), which may be known exactly or may also be subject to random error. Related problems are those of choosing the best measures of central tendency and dispersion of the observations. The best solutions of all three problems depend upon the distribution of the random errors. If one assumes that the values of the independent varable(s) are knwon exactly and that the errors in the observations on the dependent variable are normally distributed, then it is well known that the mean is the best measure of central tendency, the standard deviaton is the best measure of dispersion and the method of least squares is the best method of fitting a regression equation. Other assumptions lead to different choices. Most practitioners have tended to make the assumption of normality and not to worry about the consequences when it is not justified. Another problem arises when the data are contaiminated by spurious observations (outliers) which come from distributions with different means and/or larger standard deviations. Many methods have been proposed for rejecting outliers or modifying them (or their weights).

AD-A029 504/8GA PC$4.00/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
The Method of Least Squares and Some Alternatives. Part II.
Journal article,
H. Leon Harter. 1974, 33p
See also Part 3, AD-A029 505.
Availability: Pub. in International Statistical Review, v42 p235-264, p281-282 Dec 74.

Descriptors: *Least squares method, Adaptive systems, Statistics, Estimates, Errors, Standard deviation, Limitations, Reprints.
Identifiers: *Regression analysis.

A very important problem in mathematical statistics is that of finding the best linear or non-linear regression equation to express the relation between a dependent variable and one or more independent variables. Given are observations, each subject to random error, greater in number than the parameters in the regression equation, on the dependent variable and the related values of the independent variables(s), which may be known exactly or may also be subject to random error. Related problems are those of choosing the best measures of central tendency and dispersion of the observation. The best solutions of all three problems depend upon the distribution of the random errors. If one assumes that the values of the independent variable(s) are known exactly and that the errors in the observations on the dependent variable are normally distributed, then it is well known that the mean is the best measure of central tendency, the standard deviation is the best measure of dispersion and the method of least squares is the best method of fitting a regression equation. Other assumptions lead to different choices. Most practitioners have tended to make the assumption of normality and not to worry about the consequences when it is not justified. Another problem arises when the data are contaminated by spurious observations (outliers) which come from distributions with different means and/or larger standard deviations. Many methods have been proposed for rejecting outliers or modifying them (or their weights).

AD-A029 505/5GA PC$4.00/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
The Method of Least Squares and Some Alternatives. Part III.
Journal article,
H. Leon Harter. 1975, 46p
See also Part 4, AD-A029 506.
Availability: Pub. in International Statistical Review, v43 n1 p1-44 Apr 75.

Descriptors: *Least squares method, Adaptive systems, Statistics, Standard deviation, Minimax technique, Regression analysis, Reprints.
Identifiers: *Robust procedures, *Outliers.

After summarizing (chronologically) the voluminous literature on measures of central tendency and dispersion, the method of least squares and numerous alternatives, the treatment of outliers and robust estimation, the author recommends a simple and reasonably robust adaptive procedure. Parts 1-4 cover the time periods 1632-1884, 1885-1945, 1946-1964 and 1965-1974, respectively. Part 5 gives conclusions and recommendations and Part 6 gives subject and author indexes.

AD-A029 506/3GA PC$4.50/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio

The Method of Least Squares and Some Alternatives. Part IV.
Journal article,
H. Leon Harter. 1975, 68p
See also Part 5, AD-A029 507.
Availability: Pub. in International Statistical Review, v43 n2 p125-190 Aug 75.

Descriptors: *Least squares method, Adaptive systems, Statistics, Linear programming, Algorithms, Minimax technique, Reprints.

No abstract available.

AD-A029 507/1GA PC$3.50/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
The Method of Least Squares and Some Alternatives. Part V.
Journal article,
H. Leon Harter. 1975, 12p
Includes Addendum to Part 4. See also Part 6, AD-A029 508.
Availability: Pub. in International Statistical Review, v43 n3 p269-278 Dec 75.

Descriptors: *Least squares method, Adaptive systems, Statistics, Errors, Regression analysis, Probability density functions, Reprints.

No abstract available.

AD-A029 508/9GA PC$4.00/MF$3.00
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
The Method of Least Squares and Some Alternatives. Part VI. Subject and Author Indexes.
Journal articles,
H. Leon Harter. 1976, 48p
See also Part 1, AD-A029 503.
Availability: Pub. in International Statistical Review, v44 n1 p113-159 Apr 76.

Descriptors: *Least squares method, Adaptive systems, Statistics, Indexes, Reprints.

No abstract available.

AD-A029 509/7GA PC$3.50/MF$3.00
North Carolina Univ At Charlotte Dept of Mathematics
Positive Dependence of the Bivariate and Trivariate, Absolute Normal, T, X square F Distributions.
Technical rept.,
M. Abdel-Hameed, and Allan Sampson. Sep 76, 17p
Contract N00014-76-C-0840, Grant AF-AFOSR-2999-76
Prepared in cooperation with Abbott Labs., North Chicago, Ill. Sponsored in Part by Contract N00014-67-A-0235-0006, Florida State Univ., Tallahassee.

Descriptors: *Multivariate analysis, *Distribution functions, Probability density functions, Random variables, Theorems, Sequences.
Identifiers: Bivariate distributions, Trivariate distributions.

The bivariate, and trivariate, density of the absolute normal distribution is shown to be totally positive of order 2. These results are then used to show that a generalized bivariate, and trivariate, t, x squared and F distributions are associated. A conjecture of the total positivity of the multivariate absolute normal distribution and association of a multivariate t-distribution is given.

AD-A029 552/7GA PC$3.50/MF$3.00
Colorado State Univ Fort Collins Dept of Mathematics
Periodic Quadratic Spline Interpolant of Minimal Norm.
Interim rept.,
Guenter Meinardus, and G. D. Taylor. 1976, 8p
AFOSR-TR-76-0996
Grant AF-AFOSR-2878-76

Descriptors: *Quadratic equations, *Splines(Geometry), *Interpolation, Polynomials, Operators(Mathematics), Mapping(Transformations), Transformations(Mathematics), Normal distribution.
Identifiers: *Spline interpolation, Spline functions, Spline approximation, Partition functions.

It is shown that the periodic quadratic spline interpolant has minimal norm if the knots are equally spaced. (Author)

AD-A029 554/3GA PC$3.50/MF$3.00
Yale Univ New Haven Conn Dept of Statistics
Inference of Latent Roots Using Asymptotic Expansions of Likelihood Functions.
Final rept. 1 Jul 75-30 Jun 76,
Robb J. Muirhead. 1976, 21p AFOSR-TR-76-1029
Grant AF-AFOSR-2882-75

Descriptors: Asymptotic series, *Multivariate analysis, Population(Mathematics), Distribution functions, Analysis of variance, Matrices(Mathematics), Correlation techniques, Discriminate analysis.
Identifiers: Likelihood functions, Latent roots, Inference.

The most commonly used multivariate techniques include principal component analysis, factor analysis, canonical correlation analysis, multivariate analysis of variance and discriminant analysis. All of these techniques involve the latent roots and vectors of random matrices and it is important to be able to make inferences about the population parameters, or a subset of them. Unfortunately, even under the usual assumption that the observations have been drawn from a multivariate normal population, the exact sampling distributions of these random roots and vectors are generally extremely complicated and it appears difficult, if not impossible, to use them (or the corresponding likelihood functions) directly for inferential purposes. There are two reasons; firstly, the distributions are complicated and very difficult to evaluate numerically (and, as a consequence, the likelihood functions are intractable) and secondly, it is not at all obvious how one should draw inferences about, for example, a few parameters in the presence of many nuisance parameters. This report is concerned with problems such as these in connection with the latent roots occurring in the following three multivariate situations based on normal populations: (1) Principal component analysis; (2) Multivariate analysis of variance and discriminant analysis; and (3) Canonical correlation analysis. (Author)

AD-A029 555/0GA PC$4.00/MF$3.00
North Carolina Univ At Chapel Hill Dept of Statistics
A Survey of Sequential Approaches to the Problem of Selecting the Best of K Populations.
Interim rept.,
William L. Lane. Jul 76, 46p Mimeo Ser-1079, AFOSR-TR-76-1030
Grant AF-AFOSR-2796-75

Descriptors: *Sequential analysis, Statistical distributions, Distribution functions, Population(Mathematics), Selection, *Ranking.

The current literature on sequential ranking and selection procedures is surveyed. Special emphasis is placed on unpublished results concerning procedures which eliminate inferior populations early in the experiment. (Author)

AD-A029 557/6GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Electrical Engineering
Inverses of Toeplitz Operators, Innovations, and Orthogonal Polynomials.
Interim rept.,
T. Kailath, A. Vieira, and M. Morf. Dec 75, 8p
AFOSR-TR-76-1036
Contracts F44620-74-C-0068, N00014-67-A-0112-0044
Presented at Proceedings of 1975 IEEE Conference on Decision and Control, Houston, Texas, p749-754 Dec 75.

Descriptors: *Operators(Mathematics), Polynomials, Formulas(Mathematics), Orthogonality, Matrices(Mathematics), Covariance, Time, Kernel functions.
Identifiers: *Topeplitz operators, Orthogonal functions.

Several interconnections between the topics mentioned in the title are described-- In particular, how some previously known formulas for inverting Toeplitz operators in both discrete- and continuous- time can be interpreted as versions of the Christoffel-Darboux formula for the biorthogonal Szego and Krein polynomials on the circle and the line, respectively. The discrete-time inversion result is often known as Trench's formula, while the continuous-time result was apparently first deduced (in radiative transfer theory) by Sobolev. The concept of innovations is used to motivate the definitions of the Szego and especially the Krein orthogonal functionals, and connections to work on the fitting of autoregressive models and inversion of the associated covariance matrices are also noted.

AD-A029 558/4GA PC$4.00/MF$3.00
Carnegie-Mellon Univ Pittsburgh Pa Dept of Statistics
A Diffusion Approximation Analysis of a General n-Compartment System.
Interim rept.,
John P. Lehoczky, and Donald P. Gaver. Jun 76, 32p TR-110, AFOSR-TR-76-1058
Grants AF-AFOSR-2642-74, NSF-AG-467

Descriptors: *Stochastic processes, *Approximation(Mathematics), *Compartments, *Diffusion, Differential equations, Models, Time dependence, Parameters, Solutions(General), Matrices(Mathematics).
Identifiers: *Diffusion approximations, Random noise.

A new approach to the stochastic analysis of general compartment models is presented. The analysis is based on the concept of diffusion approximations. The state of a compartment system is represented as the superposition of a deterministic process, characterized by a system of ordinary differential equations, and a random noise process characterized by stochastic differential equations. All transition rate parameters are permitted to be time dependent. Numerical solutions are presented for the two-compartment case, and compared with those of Cardenas and Matis (1975a). Extensions to non-linear compartment models are discussed. (Author)

AD-A029 635/0GA PC$4.00/MF$3.00
Naval Postgraduate School Monterey Calif
Limit Cycles in a Damped and Biased Relay System,
Arthur L. Schoenstadt. Aug 76, 46p Rept no. NPS-53Zh76081

Descriptors: *Control theory, *Probability, *Differential equations, *Relays, Oscillation, Optimization, Matrices(Mathematics), Polynomials.
Identifiers: Piecewise linear analysis, Bifurcation theory, Limit cycle solutions.

This paper considers the necessary and sufficient conditions for limit cycle solutions in a damped and biased relay system.

AD-A029 655/8GA PC$4.50/MF$3.00
Pennsylvania State Univ University Park Coll of Business Administration
Approximations of Two-Attribute Utility Functions.
Interim rept.,
Peter C. Fishburn. Sep 76, 56p Rept no. TR-20
Contract N00014-75-C-0857

Descriptors: *Approximation(Mathematics), Special functions(Mathematical), Set theory, Decision theory, Transformations(Mathematics).
Identifiers: *Utility functions, *Von Neumann-Morgenstern utility functions, Affine transformations, Monotonicity.

This report considers the assessment of von Neumann-Morgenstern utility functions u defined on two attributes from the viewpoint of mathematical approximation theory. It focuses on approximations v of u that can be written as $v(x,y) = f(1)(x)g(1)(y) + ... + f(m)(x)g(m)(y)$ where the f(i) and/or g(i) are based on single-attribute conditional utility functions. The paper does not rely on independence axioms that enable u(x,y) to be expressed in simplified forms when they are valid. (Author)

AD-A029 656/6GA PC$4.00/MF$3.00
Pennsylvania State Univ University Park Coll of Business Administration
Continua of Stochastic Dominance Relations for Bounded Probability Distributions.
Interim rept.,
Peter C. Fishburn. Sep 76, 31p Rept no. TR-21
Contract N00014-75-C-0957

Descriptors: *Stochastic processes, *Probability distribution functions, Decision theory, Dominance models, Continuity, Set theory, Risk, Integration.
Identifiers: Utility classes, Boundedness, Stochastic dominance, Risk aversion, Fractional integrals.

Notions of first degree and second degree stochastic dominance in decision making under risk have been developed and used for more than a decade. This report extends these notions to Alpha-degree stochastic dominance for every real number Alpha equal to or greater than unity. The extensions are accomplished using a standard version of fractional integral, and classes of utility functions that are congruent with the stochastic dominance relations are identified. (Author)

PB-256 851/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Samuel Stanley Wilks.
Final rept.,
Churchill Eisenhart. 1976, 7p
Pub. in Dictionary of Scientific Biography, v14 p381-386 1976.

Descriptors: *Statistical analysis, *Bibliographies.
Identifiers: Reprints, *Wilks Samuel Stanley.

The paper includes the following: A review of the life and work of Samuel Stanley Wilks (1906-1964); his impact on the development of mathematical statistics, and on the development of statistical education in the United States; his services to the U.S. Government, and to the social sciences; and, a bibliography of principal original works, and of major secondary literature.

PB-256 891/3GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
A Hierarchical Concept for Man-Machine Communication.
Final rept.,
J. S. Albus, J. M. Evans, and E. G. Johnsen. Oct 74, 5p
Pub. in Proceedings of Annual Meeting of the Human Factors Society (18th), Huntsville, Ala., October 15-17, 1974. Paper in Benefits for Mankind, p506-509 Oct 74.

Descriptors: *Man machine systems, *Control theory, Automatic control, Robots, Interfaces.
Identifiers: CMAC(Cerebellar Model Articulation Controller), Cerebellar model articulation controller.

The problem of man controlling or programming a machine may be considered as a hierarchy of control functions, with each level of control calling up ordered sequences of operations at the next lower level, using appropriate sensory feedback for each level. Man may enter the control hierarchy at any level for direct control or for programming an automatic system for later playback. The computer carries out lower level control functions, thereby augmenting man's control capabilities. The Cerebellar Model Articulation Controller (CMAC) is a computer based control system in which high-level task-oriented commands can be broken down into a series of elemental motor actuator signals. CMAC is a general purpose adaptive control concept which can be arranged in a hierarchical structure, such as that described above, so as to facilitate the man-machine communication problem. For example, CMAC can solve the coordinate transformation problem so that commands can be given in terms of desired end point trajectories. Furthermore, CMAC can handle many feedback variables such as measurements of misalignment of parts, variable mass loading, irregularities in materials, and constraints imposed by an external environment. Concepts of man-machine communication under consideration by the NBS Automation Technology Program are presented with particular emphasis on the CMAC control concept.

PB-256 895/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Leaves of Trees.
Final rept.,
Peter J. Slater. 1975, 11p
Pub. in Proceedings of Southeastern Conference on Combinatorics, Graph Theory, and Computing (6th), Boca Raton, Fla., February 17-20, 1975, p549-559 1975.

Descriptors: *Graph theory, *Trees(Mathematics), Theorems.

If v is a vertex of degree at least three in a tree T and at least one branch at v is a path, then the subgraph of T consisting of the union of all such branch paths at v is called a leaf of T. There are infinitely many trees T with a given leaf structure (of two or more leaves), but certain of their parameters, such as the number of edges it is necessary to add to T to produce a 2-connected graph, are the same. Simple formulas are given for some of these parameters.

12B. Operations Research

AD-A029 167/4GA PC$4.00/MF$3.00
Wisconsin Univ Madison Dept of Industrial Engineering
Conservation Equations and Their Application to Queuing Simulations.
Technical rept.,
Averill M. Law. Apr 76, 27p Rept no. TR-76-8
Contract N00014-76-C-0403

Descriptors: *Queueing theory, Consumers, Commerce, Simulation, Probability.
Identifiers: *Consumer waiting time, Estimators.

In this paper the study of efficient estimators is continued for simulated queuing systems. It was shown previously that it is more efficient to estimate the first moments of all the usual measures of performance from an estimate of mean wait in queue than to estimate them directly. Some new conservation equations were derived which were then used to obtain efficient estimators of the variances of the usual measures of performance. Also introduced was an estimator which is more efficient than the usual estimator for the probability that an arriving customer is blocked.

AD-A029 244/1GA PC$3.50/MF$3.00
North Carolina Univ At Charlotte Dept of Mathematics
Optimal Replacement of Damaged Devices.
Technical rept.,
M. Abdel-Hameed, and I. N. Shimi. Jul 76, 13p
Contract N00014-76-C-0840

Descriptors: *Replacement theory, Probability, Shock(Mechanics), Damage, Poisson ratio, Failure, Cost analysis, Mathematical models, Policies.

Suppose that a device is subject to a sequence of shocks occurring randomly at times n = 1, 2,..., according to a Poisson distribution. Shocks cause damage and damages accumulate additively. The device can be replaced before or at failure. The cost of replacement before failure depends on the cumulative damage at replacement time. Cost of replacement at failure is assumed to be a constant. In this paper the authors derive the optimal replacement policy for such devices using the long run average cost criterion. (Author)

AD-A029 318/3GA PC$3.50/MF$3.00
Army Missile Command Redstone Arsenal Ala Cost Analysis Div
Dependent (Conditional) Probability Aspects of Cost Estimating.
Edward L. Murphy, Jr. Aug 76, 17p

Descriptors: *Cost Estimates, *Statistical analysis, Probability, Weapon systems, Military procurement, Methodology.

An analytical procedure can be applied to provide decision makers with insight for making an optimum decision. The procedure is not limited to consideration of only three variables. It can be applied to evaluate conditional aspects of performance cost or time of one part of a system with one or more parts of the same or other systems.

AD-A029 657/4GA PC$3.50/MF$3.00
Pennsylvania State Univ University Park Coll of Business Administration
Axioms for Expected Utility in n-Person Games.
Interim rept.,
Peter C. Fishburn. Sep 76, 22p Rept no. TR-22
Contract N00014-75-C-0857

Descriptors: *Game theory, *Probability distribution functions, Theorems, Strategy, Models, Linear systems, Transformations(Mathematics).
Identifiers: Axioms.

The von Neumann and Morgenstern utility axioms apply to an individual's preferences on a set of probability distributions that is closed under convex linear combinations. However, in a rectangular game situation, the probability distributions on outcomes that correspond to choices of mixed strategies for the players is

not generally closed under convex combinations. Axioms are specified for an individual's preference relation on the space of mixed strategies for the n players. These axioms are necessary and sufficient for a multilinear expected utility model that reduces to the von Neumann-Morgenstern form. The utility function is unique up to a positvie affine transformation. (Author)

PB-256 887/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Problem 75-12, An Average Distance.
Final rept.,
H. J. Oser. Jul 76, 6p
Pub. in Problems and Solution, v18 n3 p497-501 Jul 76.

Descriptors: *Integral equations, Transportation models, Computation.
Identifiers: Reprints, *Average distance.

Take two unit squares and place them side by side so they form a rectangle two units wide and one unit high. Now choose a point A at random in the first square and, again at random, a point B in the second square. Then A and B will be a certain distance apart. Question: If we repeat the random choice of A and B many times, how far apart will they be on the average.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A029 378/7GA PC$3.50/MF$3.00
Williams (John S) Newbury Park Calif.
Survey of Available Systems for Improving Heat Transfer in Air Conditioning Chiller Condensers.
Final rept. Feb-Jul 76,
John S. Williams. Jul 76, 16p CEL-CR-76.004
Contract N68305-76-C-0018

Descriptors: *Heat transfer, *Condensers(Liquefiers), *Air conditioning equipment, *Refrigerant condensers, Cleaning, Tubes, Brushes, Foam rubber, Spheres, Cooling and ventilating equipment.
Identifiers: Foam rubber balls.

A survey of available systems which claim to maintain or improve the heat transfer ability of air conditioning condensers was performed. Two systems were identified, both of German origin. One system called the 'M. A. N. On-Load Tube Cleaning System' uses small brushes to keep the condenser tubes clean. This system is distributed by Water Sevices of America, Inc. The other system, handled by Amertap of Mineola, New York, uses small foam rubber balls to maintain and clean the condenser tubes. Several users of these systems were identified and visited. The M.A.N. system appears to require less day to day maintenance and is more widely used. In view of the many modified air conditioning units located at nongovernmental organizations, it is considered unnecessary to conduct formal tests before approving the general use of the M. A. N. system. It is recommended however, that a comparison test be made of the two systems. Because performance data are more easily obtained from centrifugal chillers than other systems, this type should be the first modified. Performance data should be obtained both before and after installation to verify the two year payback period predicted in this report. Locations in the Washington, DC, or Norfolk area look most promising. (Author)

NTIS/PS-76/0727/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solar Space Heating and Air Conditioning (Citations from the NTIS Data Base).
Rept. for 1964-Sep 76,
Audrey S. Hundemann. Sep 76, 261p*
Supersedes NTIS/PS-75/689, and NTIS/PS-75/345. See also NTIS/PS-76/0728.

Descriptors: *Bibliographies, *Solar space heating, *Solar air conditioning, *Buildings, Residential buildings, Commercial buildings, School buildings, Feasibility, Economic factors, Project planning, Environmental impacts, Social effect, Performance evaluation.
Identifiers: Retrofitting.

Design, technical feasibility, performance, and economic factors pertaining to solar heating and cooling of buildings are discussed. Commercial buildings, schools, and residential buildings are covered, with emphasis on the assessment of solar heating and cooling systems for residential buildings. Included are a few abstracts of reports on solar energy as a national energy resource; solar energy research program alternatives; and social, environmental, and institutional factors affecting the feasibility of using solar energy for heating and cooling buildings. (This updated bibliography contains 256 abstracts, 133 of which are new entries to the previous edition.)

NTIS/PS-76/0728/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solar Space Heating and Air Conditioning (Citations from the Engineering Index Data Base).
Rept. for 1970-Sep 76,
Audrey S. Hundemann. Sep 76, 170p*
See also NTIS/PS-76/0727.

Descriptors: *Bibliographies, *Solar space heating, *Solar air conditioning, *Buildings, Residential buildings, School buildings, Heat pumps, Rankine cycle, Design, Economic factors, Performance evaluation, Feasibility.

The use of solar energy to heat and cool buildings is discussed with emphasis on the heating and cooling of residential buildings and schools. Design, technical feasibility, economics, and performance simulation studies are covered. Included are abstracts pertaining to solar assisted heat pump systems and assessment of solar heated Rankine cycle cooling. (Contains 163 abstracts)

PB-256 405/2GA PC$5.50/MF$3.00
Acurex Corp., Mountain View, Calif. Aerotherm Div.
Feasibility of a Direct Contact Heat and Emission Loss Prevention System for Area Source Furnaces.
Final rept. Jun-Oct 75,
R. J. Schreiber, and G. G. Poe. Apr 76, 122p
Aerotherm-75-179, EPA/600/2-76/121
Contract EPA-68-02-1318

Descriptors: *Air pollution control equipment, *Residential buildings, *Air furnaces, *Scrubbers, *Energy conservation, Hot water heating, Waste heat, Heat recovery, Nitrogen oxides, Carbon monoxide, Particles, Sulfur oxides, Hydrocarbons, Cost analysis, Design, Drawings.
Identifiers: *Retrofit devices, Residential sector, Oil heating, Particulates, HELPS devices.

The report gives results of a brief study to determine the feasibility of a retrofit device for recovering emissions and waste heat from the flue of a residential furnace. The device resembles a small wet scrubber and collects virtually all of the oil-fired furnace's particulate, NO2, SO3, and UHC, as well as increasing the unit's efficiency to greater than 95%. The payback period is highly dependent on fuel cost. A laboratory test program is recommended to determine operating characteristics.

PB-256 806/1GA PC$11.00/MF$3.00
Institute of Gas Technology, Chicago, Ill.
Burner Design Criteria for Control of NOx from Natural Gas Combustion. Volume II. Raw Data and Experimental Results.
Final rept. Jun 73-Sep 75,
D. R. Shoffstall. Jun 76, 416p EPA/600/2-76/098b
Contract EPA-68-02-1360
See also PB-254 167.

Descriptors: *Gas burners, *Air pollution control, *Nitrogen oxides, Tables(Data), Kilns, Baffles, Boilers, Combustion products, Electric power generation, Heat transfer, Flames, Natural gas.
Identifiers: Air fuel ratio.

Volume I of the report gives details of, and analyzes, trials conducted with natural gas to determine the relationship between combustion aerodynamics and pollution emission characteristics of industrial burners. Three burner types were studied (kiln, ported baffle, and movable vane boiler), based on relative gas load and estimated total industrial emissions. Experimental measurements on a pilot-scale furnace included baseline characterization of each burner and variation of primary operating parameters (air preheat, air/fuel ratio, firing rate, heat release rate, position of gas nozzle in burner block, and air swirl intensity). Additional emissions data were gathered for suspected control conditions (fuel injector design, flue gas recirculation, fuel/air momentum ratio, and burner block angle). It also describes in detail the experimental facility and sampling probes used to collect the data. Volume II discusses completely the procedure used to select the test burners. It includes detailed flame characterizations of baseline operations assembled from in-the-flame temperature, gas species, and flow direction data analysis. Similar in-the-flame studies were made for control conditions which minimized emissions for each burner type. It also includes all raw data collected from the input/output trials.

13B. Civil Engineering

AD-A029 176/5GA PC$9.00/MF$3.00
Value Engineering Co Oxnard Calif
Environmental Protection Guide,
W. H. DeZarala, C. L. Crader , and C. J. Levasseur . 25 Aug 75, 254p Rept no. ED-6153
Contract N62578-74-C-0034

Descriptors: *Guides, *Naval procurement, *Military vehicles, *Air pollution control equipment, Naval equipment, Specifications, Passenger vehicles, Trucks, Earth handling equipment, Tractors, Trailers, Rollers, Compactors, Heavy duty, Vehicles, Standards, Noise pollution, Internal combustion engines, Emission control, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Crankcases, Evaporation, Smoke, Exhaust gases, Tables(Data), Industrial equipment, Motorcycles.
Identifiers: *Noise reduction.

This Environmental Protection Guide was prepared under Contract N62578-74-C-0034 issuded by the Naval Facilities Engineering Command, Davisville, Rhode Island and summarizes all pertinent information in a readily accessible format. It is intended for the use of Navy personnel involved or concerned with the preparation and/or updating of Military or Federal specifications utilized for procurement of industrial equipments capable of emitting specified pollutants or exceeding established

noise-level criteria. This document is expected to serve as the primary consolidated data source for all available information relating to existing and anticipated emissions control standards and goals at both the State and Federal levels; for the manufacturing sources and associated configurations of the prime equipments available to satisfy expected future Navy procurement needs, and which must incorporate adequate protective design features or devices to meet established pollution control requirements; and for the types, sources, and capabilities of the commercially available pollution control devices/equipments which may be designated, as appropriated, in Navy procurement actions. Finally, the guide offers recommended stadardized language, for inclusion as a part of the procurement specification itself, that will permit applicable regulations, standards, Government codes, and the like (as they relate to emissions or noise pollution control) to be properly and completely addressed in a manner calculated to ensure receipt of the desired end item hardware configuration. (Author)

AD-A029 187/2GA PC$6.75/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Semiannual Interagency Briefing (6th), February 1976, Washington, D. C.
Final rept.,
Charles C. Calhoun, Jr., Robert M. Engler, Mark D. Malkasian, Robert M. Meccia, and Hanley K. Smith. Jul 76, 153p Rept no. WES-MP-D-76-19
Report on Dredged Material Research Program.

Descriptors: *Dredging, Scientific research, Waste disposal, Field tests, Resource management, Feasibility studies, Turbidity, Water quality, Costs, Ecology, Aquatic organisms, Land use.
Identifiers: *Solid waste disposal.

This paper presents the edited text and prints of slides of the February 1976 briefing on the status of the Dredged Material Research Program (DMRP) being directed at the U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. The briefing summarizes the status, phases, and goals of the DMRP. Field studies are demonstrating the productive uses of dredged material and the feasibility of dredged material becoming a natural resource. Problems, accomplishments, and objectives within each of the four projects are discussed: the Environmental Impact's and Criteria Development Project, the Habitat Development Project, the Disposal Operations Project, and the Productive Uses Project. The research covers a diversity of problems on the disposal, effects of disposal, and possible uses of dredged material.

AD-A029 315/9GA PC$5.00/MF$3.00
Geological Survey, Harrisburg, Pa. Water Resources Div.
Preliminary Results of Preimpoundment Water-Quality Studies in the Tioga River Basin, Pennsylvania and New York.
Interim rept. Sep 73-May 75,
Janice R. Ward. Jul 76, 87p Rept nos. USGS/WRD/WRI-76/059, USGS/WRI-76-66
Report on Water Resources Investigations.

Descriptors: *Water quality, Rivers, Water pollution, Mines(Excavations), Acids, Sampling, Alkalinity, Chemical analysis, Carbonates, Drainage, Aquatic organisms.
Identifiers: *Tioga River, Pennsylvania, New York.

The Tioga River and its major tributaries were sampled monthly from September 1973 to May 1975. Water quality in the Tioga River is degraded by acid-mine drainage entering the stream near Blossburg from strip- and deep-mined areas. The stream supports few species of aquatic life from Blossburg to its confluence with Crooked Creek. Alkaline water of tributaries Mill Creek, Crooked Creek, and the Cowanesque River counteract the acidity carried downstream from Blossburg, and the Water-quality of the Tioga River gradually improves, supporting a more diversified population of fish and aquatic life. Relationships between selected water-quality parameters have been developed for the sampling stations throughout the basin. Downstream trends were also examined. The relationships will be further refined and implemented in predictive water-quality models as more data are collected. (Author)

AD-A029 329/0GA PC$6.00/MF$3.00
Transportation Systems Center Cambridge Mass
Risk Analysis Methods for Deepwater Port Oil Transfer Systems.
Final rept. Jul 75-Mar 76,
L. Frenkel, and W. T. Hathaway. Jun 76, 146p TSC-USCG-76-2, USCG-D-69-76

Descriptors: *Oil spills, *Risk analysis, Deep water, Oil pollution, Marine transportation, Fault tree analysis, Detection, Transfer.
Identifiers: *Deepwater terminals, Transportation safety, Oil pollution detection, Oil pollution abatement.

This report deals with the risk analysis methodology for oil spills from the oil transfer systems in deepwater ports. Failure mode and effect analysis in combination with fault tree analysis are identified as the methods best suited for the assessment of comparative risk from different technical alternatives. The necessary methodology and analytical expressions are developed and their application is demonstrated in some general sample calculations. Basic data sources are listed, and the quality of the data is discussed. It is shown that the available data are not sufficiently complete for quantitative calculations of the risk for the entire system. Comparative calculations, however, can be made, and a systematic qualitative examination of the system is possible.

AD-A029 335/7GA PC$3.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Impact of Environmental Regulation on Defense System Acquisition Management.
Study project rept.,
James L. Graham, Jr. May 76, 22p

Descriptors: *Environmental protection, *Law(Jurisprudence), *Military procurement, Environmental impact statements, Impact, Air pollution, Water pollution, Environmental management, Noise pollution, Reduction, Policies, Management planning and control, *Department of Defense.

This report outlines major environmental legislation and regulation that applies to defense system acquisition management. Through document research and interviews, the report discusses various effects of environmental regulation on the Defense Department, on defense contractors, and on defense acquisition program managers. Examples of several types of impacts show the importance of thoroughly considering environmental regulation, particularly early in a program. The report can serve as a point of departure for future analysis, research, and case study preparation by DSMS students. (Author)

AD-A029 355/5GA PC$4.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Development of Navigation with Locks and Dams.
Final rept.,
John J. Franco. Jun 76, 52p Rept no. WES-MP-H-76-15

Descriptors: *Dams, *Barges, *Navigation, *Rivers, *Waerways, Streams, Inland waterways, River currents.
Identifiers: *Locks(Waterways), *Marine naviga (U)

The need for locks and dams for the development of navigation on some streams and the problems that could be encountered are discussed in this report. Satisfactory navigation conditions depend on the site selected, characteristics of the stream, orientation and arrangement of the structure and related facilities, and type of traffic anticipated. Tows approaching the locks could be affected by adverse currents that could be hazardous or cause delays. The lock arrangement should consider the currents to be caused by the completed structure and the effects of these currents on the movement of tows. Model studies can be invaluable in determining the adequacy of a proposed structure and modifications required to eliminate any undesirable conditions. New concepts in lock arrangements should be considered to improve safety and efficiency. Shoaling in the lock approaches can present serious problems but can be eliminated or minimized with special structures. Cofferdam plans should consider maintenance of navigation during construction and the effect of scour on its stability. Deflectors can be used to move the scour area away from the main cofferdam. (Author)

AD-A029 357/1GA PC$3.50/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Debris of the Chena River,
Terry McFadden, and Michael Stallion. Jul 76, 20p Rept no. CRREL-76-26

Descriptors: *Flood control, *Rivers, *Debris, *Soil erosion, Alaska, Dams.
Identifiers: Banks(Waterways), River banks, Log jams, *Chena River.

Debris over a 44-mile stretch of the Chena River was studied. The study area extended from the first bridge on the Chena Hot Springs Road to the Chena River Flood Control damsite. The purpose of the study was to assess the potential danger to the Chena River Flood Control Dam outlet structure. Debris was catalogued, log jams were measured, and sources of debris were studied. The average size of logs was determined, as well as the number of logs present on the river. The authors concluded that a serious debris problem existed and would remain serious for the foreseeable future. Recommendations for debris handling were made. (Author)

AD-A029 360/5GA PC$5.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Data Evaluations and Recommendations for Comprehensive Planning for the Yazoo River Basin, Mississippi. Volume I.
Final rept. Jul 75-Feb 76,
Frank W. Suggitt, Thomas J. Wood, Jonathan R. Clark, Paul R. Becker, and Ellis J. Clairain. Aug 76, 91p Rept no. WES-TR-Y-76-2-Vol-1
See also Volume 2, AD-A029 391.

Descriptors: *Water resources, *Land use, *Flood control, Geologic formation, Chemical analysis, Social sciences, Culture, Economics, Rivers, Water flow, Mississippi.
Identifiers: *Yazoo River Basin, Physiography, Physicochemical characteristics, Meander belts.

An evaluation of environmental data requirements and needs for the comprehensive planning of water and related land resources of the Yazoo River Basin was conducted. The in-

formation gathered is provided in Volume II of this report and covers the geology; physiography; physicochemical characteristics; and the aquatic, terrestrial, and sociocultural resources of the Yazoo Basin. Sufficient data are not currently available to enable the U. S. Army Engineer District, Vicksburg, to implement its plan of study in accordance with the guidelines of 'Principles and Standards' of the Water Resources Council; therefore, it is recommended that an Information Assimilation and Evaluation Program (IAEP) be initiated in order to formulate and accomplish the plan of study for the Yazoo Basin by 1980. This 5-year program includes the development of a Resource Information System for data management; environmental baseline investigations of physical, chemical, biological, and socioeconomic factors; environmental impact investigations of actual construction projects; analysis of changes taking place due to natural processes; and special investigations to evaluate nonstructural alternatives to floodwater and runoff management. Relative cost and duration for each of the 33 work units in the IAEP are provided.

AD-A029 379/5GA PC$3.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Dredged Material Research. Notes, News, Reviews, Etc. Volume D-76-3.
Jul 76, 12p

Descriptors: *Dredging, Land use, Planting, Ecosystems, Estuaries, Grasses, *San Francisco Bay.
Identifiers: Salt ponds, *Marshes, *Land reclamation.

The San Francisco District, Corps of Engineers, and the Dredged Material Research Program (DMRP) are cooperating in a study of marsh development on dredged material used to fill a salt-production pond along the banks of Alameda Creek in south San Francisco Bay. The study is described in the following article. California cordgrass (Spartina foliosa) was planted from a tractor-pulled sled in clayey dredged material. Time studies indicate that 4000 plants can be sprigged in 1 hour using this operation.

AD-A029 391/0GA PC$10.75/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Data Evaluations and Recommendations for Comprehensive Planning for the Yazoo River Basin, Mississippi. Volume II.
Final rept. Jul 75-Feb 76,
Charles R. Kolb, Charles R. Bingham, Billy K. Colbert, Ellis J. Clairain, Jr., and Jonathan R. Clark. Aug 76, 397p Rept no. WES-TR-Y-76-2-Vol-2
See also Volume 1, AD-A029 360.

Descriptors: *Water resources, *Land use, *Flood control, Geologic formation, Chemical analysis, Social sciences, Mississippi, Culture, Rivers, Economics, Water flow.
Identifiers: *Yazoo River Basin, Physiography, Physicochemical characteristics, Meander belts.

No abstract available.

AD-A029 424/9GA PC$5.00/MF$3.00
Franklin Inst. Research Labs., Rockville, Md. Science Information Services Dept.
Scrap Tire Disposal and Utilization Alternatives: A State-of-the-Art Report,
Gerald L. Ochs, and Katherine V. Coram. 1975, 81p
Contract DAAK03-75-C-0031

Descriptors: *Tires, *Waste disposal, Solid wastes, Biodeterioration, Pyrolysis, Incinerators, Hydrogenation, Recycled materials, Land use, Literature surveys, Rubber, Reefs, Chemicals.
Identifiers: Sanitary landfills, *Solid waste disposal.

A review has been made of the available worldwide literature which describes techniques and equipment used in the disposal of scrap tires. The operational procedures, feasibility, and impact of each alternative technique are discussed, and current and projected uses of scrap tires are noted. The alternative disposal techniques include biodegradation, incineration, pyrolysis, hydrogenation, sanitary landfill, physical processes, whole-tire disposal and reclaim processes.

AD-A029 447/0GA PC$5.00/MF$3.00
Picatinny Arsenal Dover N J
Annotated Bibliography, Development of Methods to Minimize Environmental Pollution, MM and T Project 54114 -- Revision 1,
Richard M. Abbott. Aug 76, 89p Rept no. PA-TM-2214-Rev-1

Descriptors: *Air pollution, *Water pollution abatement, *Environmental protection, *Bibliographies, *Munitions industry, Abstracts, Methodology, Army planning, Waste disposal, Gases, Incinerators, Oil wastes, Particulates, Monitoring, Explosives, Chemicals.
Identifiers: Arsenals, Task strategies.

A project was established by the US Army Materiel Command (now Development and Readiness Command) for the purpose of generating the technology required to bring operations of the Army ammunition plants into compliance with environmental standards. These arsenals implemented their assignments by the establishment of specific tasks. Publications generated under this project are listed in accordance with the responsible installation and the task.

AD-A029 530/3GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Annapolis Md Materials Dept
Laboratory Evaluation of the GATX Evaporative Toilet System.
Research and development rept.,
Willem Van Hees, and Louis C. Gills. Jul 73, 50p MAT-28-735, DTNSRDC-3948

Descriptors: *Sanitary engineering, *Toilet facilities, *Shipboard, *Waste treatment, *Waste disposal, Maintainability, Installation, Sludge.
Identifiers: Evaporative toilets, Evaporation.

The evaporative toilet system manufactured by General American Transportation Corporation was accepted for laboratory evaluation aboard mobile noise barge, MONOB YAG 61. After minor problems during the installation and debugging periods, the system operated over 700 hours before a critical failure was recorded on 7 January 1973. The failure was due in part to a plumbing arrangement. Corrective action was taken, and the system operated an additional 1150 hours without failure, to demonstrate successfully the required mean time between failures of 500 hours. A maintainability demonstration involving 22 maintenance events was unsuccessful due primarily to the design and installation locations of the evaporator/holding tank subsystem. The specified maximum repair time of 5 hours was exceeded by 1 hour, and the specified maximum repair time of 1 hour for components of the transport function was exceeded in two different maintenance events. Installation problems, which could be avoided in future programs, are considered the main cause for the one critical system failure and the maximum repair time of 6 hours. The odor of the water vapor released from the vent stack is the principal user objection to the system. Recommendations are made on ways to improve the reliability, maintainability, habitability, and performance of the General American Transportation Corporation system. Most of these are for areas of minor deficiencies related to the fact that the complete system was not fully tailored to the marine environment to which it was subjected during the evaluation. (Author)

AD-A029 533/7GA PC$6.75/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply Study Report. Volume 1.
Final rept.
Nov 75, 164p Rept no. WMS-76-001-R
See also Volume 2, AD-A029 534. Errata sheet inserted.

Descriptors: *Water supplies, *Potomac River, *Management planning and control, *Water resources, Water conservation, Water flow, Risk, Low costs, Economic analysis, Impact, Requirements, Consumption, Deficiencies, Reservoirs, Population, Seasonal variations, *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Droughts, Metropolitan areas.

This report provides a comprehensive analysis of feasible alternative solutions to the Washington Metropolitan Area (WMA) water supply problems. It is primarily concerned with the identification of water supply needs and regional management programs that are acceptable to the Washington Metropolitan Area community. It uses as water supply planning objectives low risk, low cost, flexibility, limited environmental impact, social and economic equity and growth control. The three early action programs selected for presentation represent the three paths of planning in the WMA: a program concerned with environmental needs, a program which meets engineering objectives, and a compromise between these two seemingly incompatible objectives. Other volumes of this report include 'Annex A: Open Planning and Cooperation'; 'Annex B: Water Supply, Demand, and Deficits'; 'Annex C: Engineering Feasibility of Alternative Water Supply Projects'; 'Annex D, Volume 1: Effects of Water Supply Deficits'; and 'Annex D, Volume 2: Socioeconomic Impact Study of Alternative Water Supply Programs.' (Author)

AD-A029 534/5GA PC$6.75/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply Study. Annex A. Open Planning and Coordination. Volume 2.
Final rept.
Nov 75, 157p Rept no. WMS-76-001-A
See aslo Volume 3, AD-A029 535.

Descriptors: *Water supplies, *Potomac River, *Management planning and control, *Water resources, Water conservation, Water flow, Low costs, Economic analysis, Impact, Requirements, Consumption, Deficiencies, Reservoirs, Population, Risk, Estuaries, Questionnaires, *Public opinion, United States Government, State Government, *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Droughts, Metropolitan areas.

This Annex contains a description of the public participation process which took place during the Washington Metropolitan Area Water Supply Study, and those who were involved in that process. It presents desires and issues of the various Federal, State, and local agencies, as well as those of the individual citizens. These opinions were received on questionnaires, and through letters and telephone calls. A copy of the April 1974 North Atlantic Division Staff Interim Report is provided as an appendix. It responds directly to a series of questions, concluding that the Washington Metropolitan Area

(WMA) could wait until 1990 for new programs to become operational if the area population were willing to accept the risk of a less than 30-day drought. The interim report also indicates that projects other than upstream reservoirs should be investigated. (Author)

AD-A029 535/2GA PC$5.00/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply Study. Annex B. Water Supply, Demand and Deficits. Volume 3.
Final rept.
Nov 75, 82p Rept no. WMS-76-001-B
See also Volume 4, AD-A029 536.

Descriptors: *Water supplies, *Potomac river, *Management planning and control, Water resources, Water conservation, Water flow, Low costs, Economic analysis, Consumption, Deficiencies, Requirements, Impact, Cost analysis, Energy consumption, Population, Forecasting, Estuaries, Ground water, *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Metropolitan areas, Tables(Data), Computer programming.

This Annex describes the assumptions and procedures upon which the water supply and demand conditions and resulting problems in the Washington Metropolitan Area (WMA) are based. The Annex is written primarily for the technician, providing definition of technical terms, delineation of assumptions and explanation of procedures. The first section of Annex B contains four main components; definition of the study area (Washington Standard Metropolitan Statistical Area), a projection of demands, an assessment of the supplies, and projection of supply and demand future interrelations. The second section deals with the results of the supply/demand analysis and the impacts of project solutions that relate to costs and energy consumption. The supply/demand results are summarized in graphic and tabular form using as target years 1980, 2000, 2020. The baseline used for the supply data is the monthly 1930 flow. An explanation of the computer program used for impact analysis is also provided. (Author)

AD-A029 536/0GA PC$9.75/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply. Volume 4. Annex C. Engineering Feasibility of Alternative Water Supply Projects.
Final rept.
Nov 75, 321p Rept no. WMS-76-001-C
See also Volume 5, AD-A029 537.

Descriptors: *Water supplies, *Potomac River, *Management planning and control, *Water resources, Water conservation, Water flow, Low costs, Environmental protection, Economic analysis, Impact, Requirements, Consumption, Deficiencies, Waste water, Treatment, Site selection, Ground water, Estuaries, Dams, Reservoirs, Construction, Cost analysis, *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Metropolitan areas.

This Annex describes feasibility and costs of all water supply projects and alternative programs for the Washington Metropolitan Area (WMA). The Annex can be divided into two parts. The first describes the water supply projects investigated. These projects include upstream reservoirs, such as Verona and Sixes Bridge, local impoundments (e.g., Catoctin Creek and Goose Creek), raw-water interconnections, groundwater withdrawal, indirect wastewater reuse, and the use of estuarine water. The second section describes and analyzes the Northeastern United States Water Supply (NEWS) Study programs in terms of ability of component projects to meet program objectives. Individual introductions, descriptions and tabular evaluations are presented for each project. The Appendixes include bases for construction cost estimates, project components basis for operation and maintenance, standby maintenance and start-up and shut-down costs. Basic design criteria such as expected influent or source quality and project effluent water quality objectives are also presented. (Author)

AD-A029 537/8GA PC$6.00/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply Study. Volume 5. Annex D, Volume 1. Effects of Water Supply Deficits.
Final rept.
Nov 75, 136p Rept no. WMS-76-001-D1
See also Volume 6, AD-A029 538.

Descriptors: *Water supplies, *Potomac River, *Management planning and control, *Water resources, Water conservation, Water flow, Low costs, Economic analysis, Impact, Requirements, Consumption, Recreation, Sociology, Policies, Hazards, Risk, Deficiencies, Population, Industries, Survival(General), *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Droughts, Metropolitan areas.

This Annex defines and assesses the socioeconomic, physical, aesthetic, and other miscellaneous short-term effects of water supply deficits of 10, 20, and 30 percent in the Metropolitan Washington Area (MWA). A methodology to determine losses in the MWA for actual and potential water shortage conditions is developed. The Annex is also intended to serve as a planning guide for the various water suppliers in the MWA, not only for estimating requirements on future water supplies, but in allocating short supplies during emergency conditions. The four major areas of emphasis in the Annex are: (1) evaluation of the Metropolitan Washington Council of Governments (MWCOG) Emergency Plan, (2) determination of the effects of deficits on water supply systems, (3) estimation of the economic impact of water supply deficits, and (4) a description of social impacts. Projections indicate a 2-week survival of MWA without serious economic damage for a water supply deficit of up to 30 percent, especially in the tourist industry, commercial enterprises and light industries which use large quantities of water. People who have the least mobility and resources are found to suffer the greatest social impacts from large deficits. Also indicated are interconnections among water supply systems and uniform standby ordinances on restriction of commercial and outside water use. (Author)

AD-A029 538/6GA PC$9.25/MF$3.00
Corps of Engineers New York North Atlantic Div
Washington Metropolitan Area Water Supply Study. Volume 6. Annex D, Volume 2. Socioeconomic Impact Study of Alternative Water Supply Programs.
Final rept.
Nov 75, 293p Rept no. WMS-76-001-D2
See also Volume 5, Ad-A029 537 and Volume 1, A029 533.

Descriptors: *Water supplies, *Potomac River, *Management planning and control, *Water resources, Water conservation, Water flow, Low costs, Consumption, Impact, Population, Recreation, Land use, Income, Taxes, Statistical analysis, Economic analysis, Sociometrics, Requirements, *District of Columbia, Virginia, Maryland, Feasibility studies.
Identifiers: Metropolitan areas.

This Annex presents the socioeconomic impacts of possible water supply systems being considered for the Washington Metropolitan Area (WMA). It describes 13 basic projects as well as five basic programs utilizing a specific combination of projects. Part I develops a statistical overview of the total WMA. Part II of the Annex provides an analysis of socioeconomic trends for each county within the area, and for the District of Columbia. The statistical analysis is supplemented with a description of planning issues and qualitative information obtained from interviews with county planning officials. This is then used as the base case against which the impacts of each project and program are measured. The impacts discussed reflect the effect of the project itself, not of the increased water supply. The impacts are measured with respect to population, employment, personal income, tax base, recreation opportunities, and land use. This Annex does not attempt to derive preuse quantative impacts or to build models for that purpose. (Author)

AD-A029 633/5GA PC$4.00/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Air Pollution Survey Guidelines for Army Installations.
Final rept.,
Bernard A. Donahue, and Gary W. Schanche.
Jul 76, 49p Rept no. CERL-TR-N-5

Descriptors: *Air pollution, *Military facilities, *Pollution abatement, Management planning and control, *Army planning, Army operations, Emission, Monitoring, Monitors, Air quality, Air, Pollutants, Dispersing, Diffusion, Meteorological data.

This report on air pollution survey techniques is the second of a series presenting solid waste, air pollutions, and water pollution survey guidelines. It is intended primarily for use by installation planning, operating, and maintenance personnel. The report presents guidelines for developing a comprehensive air pollution management plan and contains information on emission inventory procedures, source categorization, emission calculations, and regulation comparisons. Air pollution dispersion is discussed, along with factors affecting dispersion, such as source characteristics, meteorological factors, and physiological effects. A section about ambient air monitoring discusses the classification of common air pollutants and some general principles of an ambient air-monitoring network, such as instrument selection and optimum instrument siting. (Author)

E76-10462 PC$3.50/MF$3.00
Corps of Engineers, Waltham, Mass. New England Div.
The Use of LANDSAT DCS and Imagery in Reservoir Management and Operation.
Progress rept. no. 5,
Saul Cooper. 1 Jun 76, 7p NASA-CR-148593

Descriptors: *Reservoirs, Water management, New England(US), Earth Resources Program, Data collection platforms, Minicomputers, Antennas.

The author has identified the following significant results. A tally of DCP messages received shows that the number of messages increased markedly at the beginning of the year as the downlink went into operation, but dropped off in May due to computer troubles.

NTIS/PS-76/0709/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Polychlorinated Biphenyls in the Environment (A Bibliography with Abstracts).
Rept. for 1964-Sep 76,
Edward J. Lehmann. Sep 76, 93p*
Supersedes NTIS/PS-75/713.

Descriptors: *Bibliographies, *Chlorine aromatic compounds, *Environmental surveys, *Water pollution, *Ecology, Toxicology, Biphenyl, Food chains, Sources, Water analysis, Biodeterioration, Industrial wastes, Residues.
Identifiers: *Biphenyl/chloro, *Polychlorinated biphenyls, Ecosystems, Water pollution effects(Animals), Water pollution detection.

The environmental aspects of polychlorinated biphenyls (PCBs) are cited in this bibliography. Most of the studies are concerned with the toxicity, ecology, and abundance of PCBs in water. (This updated bibliography contains 88 abstracts, 36 of which are new entries to the previous edition.)

NTIS/PS-76/0717/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Fly Ash (Citations from the NTIS Data Base).
Rept. for 1964-Aug 76,
Mona F. Smith. Sep 76, 236p*
Supersedes NTIS/PS-75/646 and NTIS/PS-74/133. See also NTIS/PS-76/0718, and NTIS/PS-76/0719.

Descriptors: *Bibliographies, *Fly ash, Air pollution, Materials recovery, Utilization, Concrete, Aggregates, Construction materials, Solid waste disposal, Corrosion, Abstracts.

The abstracts cite studies on fly ash from Federally funded research. Covered are topics such as air pollution studies, material recovery, ash utilization, corrosion, ash conditioning and disposal, combustion modification, and ash use as an aggregate or soil stabilizer. (This updated bibliography contains 231 abstracts, 61 of which are new entries to the previous edition.)

NTIS/PS-76/0718/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Fly Ash. Volume 1. 1970-1974 (Citations from the Engineering Index Data Base).
Rept. for 1970-74,
Mona F. Smith. Sep 76, 233p*
See also NTIS/PS-76/0717.

Descriptors: *Bibliographies, *Fly ash, Air pollution, Air pollution control equipment, Corrosion, Composition(Property), Electrostatic precipitation, Reclamation, Solid waste disposal, Utilization, Construction materials, Concrete pavements, Soil stabilization, Electric power plants, Scrubbers, Pavement bases, Abstracts.

Abstracts covering fly ash air pollution, air pollution control, corrosion, composition and analysis, conditioning, precipitation and collection are contained in this bibliography of worldwide research. In addition, numerous reports are cited on fly ash use in construction materials, pavements and soil stabilization. (Contains 228 abstracts)

NTIS/PS-76/0719/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Fly Ash. Volume 2. 1975-July, 1976 (Citations from the Engineering Index Data Base).
Rept. for 1975-Jul 76,
Mona F. Smith. Sep 76, 113p
See also NTIS/PS-76/0717.

Descriptors: *Bibliographies, *Fly ash, Combustion, Air pollution, Air pollution control equipment, Scrubbers, Electrostatic precipitation, Corrosion, Collection, Chemical analysis, Electric power plants, Reclamation, Utilization, Concrete, Aggregates, Solid waste disposal, Construction materials, Abstracts.

Citations of worldwide research on fly ash from fossile fuel combustion are included. These studies cover fly ash scrubbing and collection, combustion modification, corrosion, ash utilization, chemical analysis and conditioning in relation to pollution control. The majority of these abstracts deal with electric power plants and fly ash use in cement. (Contains 106 abstracts)

NTIS/PS-76/0743/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Urban Storm Sewers and Water Runoff. Volume 2. 1974-June, 1976 (A Bibliography with Abstracts).
Rept. for 1964-Jun 76,
Robena J. Brown. Sep 76, 197p*
Supersedes NTIS/PS-75/602, and NTIS/PS-75/108.

Descriptors: *Bibliographies, *Surface water runoff, *Storm sewers, *Combined sewers, *Urban planning, *Water pollution control, Storms, Hydrology, Mathematical models, Overflows, Filtration, Computerized simulation.
Identifiers: *Urban hydrology, *Storm water runoff.

The research reports can be separated into three areas: Urban storm runoff problems and abatement; combined and storm sewers; and urban hydrology and its modeling. (This updated bibliography contains 192 abstracts, 87 of which are new entries to the previous edition.)

PATENT-3 959 127 Not available NTIS
Department of the Navy Washington D C
Biodegradation of Oil on Water Surfaces.
Patent,
Richard Bartha, and Ronald M. Atlas. Filed 13 Mar 75, patented 25 May 76, 4p AD-D002 838/1, PAT-APPL-558 040
Supersedes AD-D000 722.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Biodeterioration, Nitrogen, Phosphorus, Oil spills, Microbiology, Microorganisms, Bacteria, Nitrates, Phosphates, Salts, Water pollution.
Identifiers: PAT-CL-210-211, *Oil pollution removal, Nutrients.

Free-floating oil slicks on bodies of sea and fresh water are disposed of by microbial degradation at a greatly enhanced rate by applying the essential microbial nutrients, nitrogen and phosphorus, to the oil slick in a form that dissolves in or adheres to the oil and thus selectively stimulates the activity of oil-metabolizing microorganisms.

PB-254 418/7GA PC$4.50/MF$3.00
Pennsylvania Dept. of Environmental Resources, Harrisburg.
Tioga River Mine Drainage Abatement Project.
Final rept.,
Anton F. Miorin, Russell S. Klingensmith, and Richard E. Heizer. Jun 76, 74p EPA/600/2-76/106
Prepared in cooperation with Gannett Fleming Corddry and Carpenter, Inc., Harrisburg, Pa.

Descriptors: *Water pollution abatement, *Mine waters, *Coal, *Tioga River, Drainage, Strip mining, Land reclamation, Watersheds, Project planning, Tables(Data), Earth fills, Acidity, Pits(Excavations), Renovating, Soil conservation, Limestone, Sludge, Channel improvements, Pennsylvania.
Identifiers: *Mine acid drainage, Tioga County(Pennsylvania), *Water quality data.

The Tioga River Demonstration Project in southeastern Tioga County, Pennsylvania, is essentially defined by an isolated pocket of coal that has been extensively deep and strip mined within the Pennsylvania Bituminous Coal Field. The Tioga River watershed is subjected to acid mine drainage from abandoned mines in the vicinity of the Borough of Blossburg and the Village of Morris Run. The proposed demonstration project is recommended: (1) to demonstrate effective techniques for mine drainage abatement, (2) to reduce a specific mine drainage problem, and (3) to restore portions of a mined area to their approximate original surface grade. Techniques to be demonstrated include: restoration of strip pits utilizing agricultural limestone and sewage sludge as soil conditioners, burial of acid-forming materials within strip mines that are to be restored, and reconstruction and lining of a stream channel.

PB-255 619/9GA PC$5.00/MF$3.00
Bureau of Domestic Commerce, Washington, D.C. Environmental Affairs Div.
An Analysis of the Impact of Alternative Approaches to Significant Deterioration on the Non-Ferrous Metals Industry.
May 76, 77p* A-03-76

Descriptors: *Air pollution abatement, *Legislation, *Economic impact, *Metal industry, Smelting, Surveys, Regulations, Constraints, Analysis of variance, Government policies.
Identifiers: *Significant deterioration(Air pollution), Nonferrous metal industry, Clean Air Act Amendments of 1970, National ambient air quality standards, Air quality maintenance, Alternatives.

The report contains a Bureau of Domestic Commerce analysis of the impact of alternative approaches to significant air quality deterioration on the non-ferrous metals industry.

PB-255 641/3GA PC$8.00/MF$3.00
New Jersey Dept. of Transportation, Trenton.
New Jersey Public Transportation Study. Phase A. IT-09-0023 TS F110 (7350). Immediate Action Plan.
Mar 74, 227p UMTA-IT-09-0023-74-3
Prepared in cooperation with New Jersey Dept. of Community Affairs, Trenton, Tri-State Regional Planning Commission, New York, and Delaware Valley Regional Planning Commission, Philadelphia, Pa.

Descriptors: *Mass transportation, *Buses(Vehicles), Management planning, Coordination, Services, Transportation management, New Jersey, Federal assistance programs.
Identifiers: Public transportation, Commuter transit services, Commuter bus travel, Transit companies.

The study examined the existing public transportation characteristics and following extensive analysis the Immediate Action Plan recommends appropriate action for the preservation and extension of bus services. The study recommendations are designed to lead to improved coordination, operation and regulation of essential bus services in New Jersey and will guide the most effective use of state and federal assistance for the bus industry.

PB-255 856/7GA PC$5.00/MF$3.00
Environmental Research and Technology, Inc., Concord, Mass.
Evaluation of Air Quality in the Vicinity of the Intersection of Wisconsin and Western Avenues, N.W.
Final rept.,

Donna M. O'Toole, Ronald C. Hilfiker, and Donald G. Muldoon. Nov 75, 98p ERT-0654, FHWA-DC-OTPP-75-1

Descriptors: *Air pollution, *District of Columbia, *Streets, Intersections, Urban areas, Carbon monoxide, Monitoring, Elevation, Data acquisition, Concentration(Composition), Diurnal variations, Traffic surveys, Weather, Buildings, Quality.
Identifiers: Air quality data.

A measurement and analysis program was conducted to evaluate the spatial and temporal variation of carbon monoxide levels in the vicinity of a traffic intersection in Washington, D.C. The monitoring program provided data which permitted the evaluation of air quality levels at both the 5 and 30 foot heights. The concentrations in the vicinity of the intersection were significantly influenced by local meteorological conditions and the volume of traffic.

PB-256 106/6GA PC$4.00/MF$3.00
University of Southern Mississippi, Ocean Springs.
Bibliography of Coastal Residential Canals with Selected Annotations,
Larry L. Massey, James B. Johnston, Oscar L. Paulson, Jr., and George F. Pessoney. 1976, 36p MASGP-76-003, NOAA-76042605
Grant NOAA-04-5-158-54

Descriptors: *Canals, *Ecology, *Geologic structures, *Coastal zone management, *Bibliographies, Residential buildings, Dredging, Waterways(Watercourses), Land use zoning, Pest control, Construction, Design, Culicidae, Marshes, Aquatic biology.
Identifiers: Sea Grant program.

The bibliographic section consists of entries relating either to coastal residential canals directly, or indirectly addressing ecological and geological topics contributing to the understanding of interrelationships possibly altered by coastal canals. Many bibliographies are available which concern aspects of dredging in particular. Selected references concerning ditching for mosquito control are included. Following the bibliography are selected annotations of articles published in open journals which report of ecological investigations conducted within existing canals.

PB-256 199/1GA PC$6.00/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Undrained Deformation Behavior of Partially Consolidated Boston Blue Clay.
Technical rept.,
Winslow Davis Hawkes, III, W. Allen Marr, and T. William Lambe. Mar 76, 127p R76-18, FHWA/RD-76-S0500
Prepared in cooperation with Massachusetts Dept. of Public Works, Wellesley Hills. Research and Materials Section.

Descriptors: *Highways, *Embankments, Foundations(Structures), Soil properties, Deformation, Clay soils, Computer programming, Finite element analysis, Massachusetts.
Identifiers: FEECON computer program, *Consolidation(Soils), Boston blue clay.

This report compares predicted and measured deformations of a soft clay foundation for a high embankment subjected to an increase in surcharge load. The 40-ft high embankment has been in place over 120 ft of Boston Blue Clay since 1968. During the summer of 1974, MIT and MDPW planned to load one station to complete failure to assess methods for predicting embankment stability. Detailed predictions of vertical and horizontal deformation for the additional loading were made by several methods, mostly before field loading began. These predictions are compared with the field measurements. Predictions of vertical undrained deformation by elastic theory, the method of D'Appolonia et al, which accounts for local yielding and a finite element analysis are within a 100% of the measured values with the finite element method overpredicting settlement and the other two methods underpredicting settlement.

PB-256 200/7GA PC$4.50/MF$3.00
RAND Corp., Santa Monica, Calif.
Municipal Service Pricing: Impact on the Growth of Residential Development,
Benjamin Zycher, Laurence Dougharty, Charles Chew, and Isao Kobashi. Nov 75, 55p* R-1878/3-NSF, NSF/RA/S-75-095
Contract NSF-C895

Descriptors: *Municipalities, *Services, *Prices, *Urban development, Economic impact, Surveys, Residential buildings, Policies, Financing, California.
Identifiers: *Municipal services, Residential growth, Santa Clara County(California).

This report discusses the impact of municipal service pricing on urban structure and finance, particularly residential growth. Primary attention is paid to pricing policies for the capital recovery of services provided to new residential developments. It provides rough estimates of the effect of alternative pricing policies on the distribution of growth in Santa Clara County, California. Out of these estimates emerge guidelines for predicting whether the impact for another given community should be larger or smaller than that estimated here. The evidence supports the hypothesis that the use of development charges is a relevant policy tool available to localities for the purpose of influencing the rate and pattern of development.

PB-256 237/9GA PC$5.00/MF$3.00
Maine Univ. at Orono. Land and Water Resources Inst.
Continued Studies (Phase II) in the Search for a Predictive Model for Sludge Characterizations Useful to Design and Control of Sludge Dewatering Processes in Water Recycle Systems.
Project completion rept. 1 Jul 73-31 Dec 74,
E. G. Bobalek, R. E. Durst, Baheru Yadeta, and B. A. Cook. Jun 75, 79p 5-75, W76-11116, , OWRT-B-009-ME(1)
Contract DI-14-01-0001-4089
See also PB-233 205.

Descriptors: *Sewage treatment, *Sludge drying, *Dewatering, *Filtration, Water reclamation, Hygroscopic water, Slurries, Mathematical models, Industrial waste treatment, Pilot plants, Vapor pressure, Kinetics, Experimental design.
Identifiers: Aging(Materials).

Phase II of continuing studies to develop a predictive model for sludge characterizations was directed toward: (1) Exploring the value of the model that relates filterability to one static chemical parameter (the bound water) for complex sludges; and (2) Replacing the exacting and tedious experimental methods developed earlier for data retrieval with more convenient procedures. The goal of greater experimental convenience was achieved by (a) Replacing the laboratory filter cell system with a pilot plant scale rotary filter; and (b) Replacing the vapor pressure isotherm method for bound water measurement with a convenient instrumental method that senses relative humidity over a single sample of progressively-dried sludge cake. The goal of extending or improving the original quantitative model to make filterability predictions was frustrated when physicochemical aging effects of the complex sludges were observed. The original correlation model which ignores aging kinetics was found to be too simple for general use. However, a new laboratory method was developed which can track short and long term kinetics for most sludges provided proper sampling is conducted.

PB-256 263/5GA PC$6.00/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Stability of an Embankment on a Partially Consolidated Foundation.
Research rept.,
Francisco Silva-Tulla, W. Allen Marr, and T. William Lambe. Mar 76, 126p R76-17, FHWA/RD-76-S0501

Descriptors: *Highways, *Embankments, Foundations(Structures), Stability, Soil properties, Clay soils, Stress analysis, Massachusetts.
Identifiers: *Consolidation(Soils), Boston blue clay.

A test fill was built on a section of embankment north of Boston with the objective of determining the appropriate strength parameters of Boston Blue Clay for stability analyses. Predictions of the fill elevation to cause failure, made before the field test began, are based on Unconfined Compression, Unconsolidated Undrained traixial, field vane and SHANSEP (Stress History and Normalized Soil Engineering Properties) undrained strengths. The Simplified Bishop and the Morgenstern-Price procedures of stability analyses are used for the predictions which are compared with the actual field test results.

PB-256 280/9GA PC$12.75/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Olentangy Environmental Control Center and Interceptor System. Delaware County, Ohio Board of Commissioners.
Environmental impact statement (Final).
Jul 76, 509p
Sponsored in part by Enviro Control, Inc., Rockville, Md.

Descriptors: *Environmental impact statement-final, *Sewage treatment, *Ohio, Plant location, Rivers, Discharge, Sewers, Ozone, Disinfection, Public health, Olentangy River, River basins, Environmental impacts.
Identifiers: Tertiary treatment, Delaware County(Ohio), Alternatives.

This final environmental impact statement on a Delaware County, Ohio, project proposes the construction of a 1.5 MGD tertiary treatment plant adjacent to the Olentangy River immediately above the Delaware-Franklin County line, with discharge adjacent to the site. Interceptor sewers will serve portions of the Olentangy and Alum Creek basins in southern Delaware County. The southern portion of the western Scioto River basin will be permanently served by the proposed Dublin interceptor, with treatment at the Columbus Jackson Pike plant. Ozone will be used for disinfection at the Olentangy Environmental Control Center. Ammonia control is anticipated to be sufficient as designed. There has been no demonstrated public health hazard from sewage treatment plant aerosols. Secondary impacts from the proposed project will require local mitigation.

PB-256 310/4GA PC$6.00/MF$3.00
Monsanto Research Corp., Dayton, Ohio.
Source Assessment: Severity of Stationary Air Pollution Sources-A Simulation Approach.
Final rept. Jun 75-May 76,
E. C. Eimutis, B. J. Holmes, and L. B. Mote. Jul 76, 133p* MRC-DA-543, EPA/600/2-76/032e
Contract EPA-68-02-1874
See also PB-253 479.

Descriptors: *Air pollution, *Assessments, *Computerized simulation, *Environmental impacts, Monte Carlo method, Combustion

products, Industrial wastes, Numerical analysis, Sources, Coal, Electric power plants, Atmospheric models, Mathematical models, Computer programs, Statistical analysis, Chi square test, Concentration(Composition).
Identifiers: *Point sources, *Stationary sources.

The report gives results of a study simulating the establishment of the severity of stationary air pollution sources. The potential environmental impact of an emission source can be determined from the source severity (the ground level concentration contribution of pollutants relative to some potentially hazardous concentration of the same species). The frequency distribution of the severity of well-documented source types can be examined deterministically. A statistical approach is required to simulate the frequency distribution of the severity of source types that are complex or involve a large number of emission points in order to ultimately assess such sources. A Monte Carlo simulation technique is described in this report, together with efficient algorithms for fitting the inverse Weibull, gamma, normal, and log-normal cumulative density functions. Significant correlation is demonstrated between deterministic and simulated severity results using coal-fired steam/electric utilities as an example.

PB-256 313/8GA PC$6.00/MF$3.00
Houston (Colin A.) and Associates, Inc., Mamaroneck, N.Y.
Economic Analysis of Effluent Guidelines for the Soap and Detergent Industry.
Final rept. on Phase 1,
Colin A. Houston, Frederick C. Herot, Norman S. Douglas, and Alfred W. Fleer. Jul 76, 127p
EPA/230/2-73/026
Contract EPA-68-01-1566

Descriptors: *Economic impacts, *Soap, *Detergents, *Water pollution economics, Water pollution standards, Industrial plants, Cost estimates, Water pollution abatement, Financing, Mathematical models, Technology, Manufacturing, Prices, Equipment, Operating costs.
Identifiers: SIC 2841.

The soap and detergent industry is characterized by a highly concentrated oligopolistic market in which, according to 1970 census data, the first four companies accounted for 70% of the value of shipments and the first eight companies accounted for 79%. Price competition is limited except in the liquid detergent field. In the marketing of household products advertising plays an important role in product differentiation. On the basis of size, the industry was segmented into the first four, the first eight, 'rest of the industry' basis. Segment I company sales ranged from $400,000,000 to over one billion dollars. Aggregate plant data indicates that the efficiency of the three groups corresponds generally to their ordering. Simulation models of representative single plant producers in the industry indicate that on a point source basis the cost to the industry of the recommended control guidelines and standards is appreciable, impacting smaller producers relatively more heavily than larger producers. This point source approach is an indirect approach in assessing control costs. Since most of the industry interconnects with public waste treatment facilities, the greatest potential cost impact of effluent control will come from rising public waste treatment charges. No adverse community, employment, or balance of payment effects are anticipated. Bibliography.

PB-256 336/9GA PC$5.50/MF$3.00
Geological Survey, Bay Saint Louis, Miss. Gulf Coast Hydroscience Center.
Unsteady-State Water-Quality Model.
Interim rept.,
Daniel P. Bauer, and James P. Bennett. Aug 76, 116p* USGS/WRD/WRI-76/054

Descriptors: *Unsteady flow, *Streams, *Water pollution abatement, Mathematical models, Dissolved gases, Oxygen, Biochemical oxygen demand, Photosynthesis, Benthos, Water quality management, Water law, Standards, Mathematical prediction.
Identifiers: *Model studies, Water quality act, Dissolved oxygen.

The unsteady-state water-quality program is based on a one-dimensional mathematical model which predicts the stream response characteristics from waste source inputs. Variables which are predicted include dissolved oxygen and biochemical-oxygen demand. The program uses a convolution approach to solve the dissolved-oxygen balance and biochemical-oxygen-demand equations. Longitudinal dispersion is, however, not considered in the program equations. The program uses a numerical integration technique for the solution of the model differential equations. The model formulation allows for unsteady-state conditions (varying flow rate and concentration) for waste and stream.

PB-256 364/1GA PC$3.50/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Research.
Extension of Carbon-Hydrogen Method to Include Determination of Volatiles or Loss on Ignition (L.O.I.) at 950 C.
Open-file rept.,
Donald L. Wilson. 1971, 14p SWR-156

Descriptors: *Solid wastes, *Chemical analysis, *Oxygen, Laboratory equipment, Experimental design, Ignition, Combustion, Volatility, Safety.
Identifiers: *Carbon hydrogen analysis.

The following topics are discussed: Apparatus, reagents, safety precautions, sample preparation, procedure, standardization, calculations, method evaluation.

PB-256 375/7GA PC$4.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Audit.
Audit Guide for Final Site Audits Under the Construction Grant Program (For Use by Independent Public Accountants).
Apr 73, 44p

Descriptors: *Sewage treatment, *Plant location, *Construction management, Grants, Auditing, Monitoring, Guidelines, Organizations, Manuals, Accounting, National government, Site selection.
Identifiers: Sewage treatment plants, Environmental Protection Agency.

The purpose of this guide is to promote a clear and common understanding of the requirements for final sewage treatment plant site audits, to obtain uniform and comprehensive audits of construction grants and an audit report that will be useful to EPA and grantee management, and to set forth the duties and responsibilities of the EPA Office of Audit, and the interrelationship with other key elements involved in monitoring and administering the construction grant program.

PB-256 376/5GA PC$4.00/MF$3.00
Shimek, Roming, Jacobs and Finklea, Dallas, Tex.
Designing to Remove Phosphorus by Using Metal Salts and Polymers in Conventional Plants.
James E. Laughlin. 2 Dec 71, 35p

Descriptors: *Sewage treatment, *Phosphorus, *Chemical removal(Sewage treatment), Metals, Iron chlorides, Polymers, Alums, Sodium, Aluminates, Flocculating, Coagulation, Clarification, Removal, Design criteria.

The report discusses the use of metal salts and polymers in otherwise conventional plants. (Tertiary systems are not covered.) These are: Metal salts: FeCl3, pickle liquor, alum, and sodium aluminate (which also provides alkalinity)...liquids are best (cost, effectiveness, flexibility, ease of handling); Polymers: most come dry; no universal choice; 3 categories.

PB-256 380/7GA PC$3.50/MF$3.00
Bureau of Solid Waste Management, Cincinnati, Ohio.
Analytical and Special Support to Division of Technical Operations and Division of Research and Development.
Annual report 1969,
Harry Stierli. 1970, 9p SWR-35
See also PB-256 381.

Descriptors: *Solid waste disposal, *Test facilities, Chemical analysis, Bioassay, Incinerators, Sanitary landfills, Composts, Residues, Management planning.

During Fiscal Year 1969 a total of 693 samples were submitted to the Research Services Laboratory for analysis. These samples were collected by the following Bureau of Solid Waste Management Divisions: Technical Operations, Research and Development and Demonstration Operations. The data secured from the analyses were in support of incinerator field tests, landfill studies, composting activities, and related solid waste disposal activities. A total of 4281 laboratory determinations were involved in this support project.

PB-256 386/4GA PC$4.50/MF$3.00
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
Operating Experience and Design Criteria for UNOX Wastewater Treatment Systems. Prepared for Environmental Protection Agency Technology Transfer Program Design Seminar for Wastewater Treatment Facilities, February 29-March 1, 1972, New York.
1972, 74p

Descriptors: *Water pollution control, *Activated sludge process, Industrial waste treatment, Microorganisms, Oxygen, Design criteria, Performance evaluation, Safety.
Identifiers: *Unox system.

Contents:
- Background and introduction;
- 'UNOX' system description;
- Operating data and experience--(Operating experience, Results from specific programs, Correlation of results for design);
- Process design--(Required process information, Oxygenation tankage design, Oxygen requirements, Oxygen supply, Operating power requirements, Sustained peak loads, Activated sluge waste quantity);
- Process safety--(Oxygen gas, Oxygen and the UNOX system);
- 'UNOX' system scope of supply--(General, Surface aeration-PSA system, Submerged turbine-cryogenic system, Instrumentation, Oxygen backup facilities, Union Carbide engineering support);
- Economic considerations.

PB-256 399/7GA PC$6.75/MF$3.00
Exxon Research and Engineering Co., Linden, N.J. Products Research Div.
Collection Efficiencies of Stack Sampling Systems for Vanadium Emissions in Flue Gases.
Final rept. Jul 74-Jun 75,
H. Lawrence Goldstein, and C. W. Siegmund.
Apr 76, 167p EPA/600/2-76/096
Contract EPA-68-02-1748

Descriptors: *Vanadium, *Sampling, *Particles, *Air pollution, *Flue gases, Combustion products, Fines, Industrial wastes, Gas analysis, Residual oils, Boilers, Efficiency, Toxicity, Experimental design, Chimneys, Sulfuric acid, Oxidation, Ash contents, Concentration(Composition), Sulfates, Collecting methods, Bibliographies, Emission spectrum, Atomic spectroscopy.
Identifiers: In plant processes, *Air pollution detection.

An experimental program has been conducted to measure and compare the efficiency of two stack sampling systems to collect vanadium-bearing particulate emissions in flue gas. One sampling system was EPA's Method 5, the other was developed by Exxon Research and Engineering Company for specialized in-house studies. To evaluate collection efficiency, an extensive factorial study was carried out in a 50 hp four-pass firetube boiler burning typical residual fuel oils. In each test the sampling systems were operated simultaneously in the stack to collect the vanadium-bearing particulate emissions. Three residual fuel oils were tested: two Venezuelan (359 and 149 ppm V) and one Arabian (39 ppm V). A vanadium balance was established for each experiment by inventorying both the particulate emissions and the particulates remaining in the boiler. Test variables, in addition to the sampling systems and fuel oils, also included two combustion residence times and two sampling probe locations. The results of the study show that vanadium collection efficiency depends on two variables: combustion residence time and sampling system. For both systems efficiency decreases as combustionresidence time increases, which results in a particulate size distribution shift to the submicron range. Where particulate emissions are in the coarse size range, collection efficiency in both sampling systems is almost quantitative. The oxidation states of vanadium in fuel oil emissions are briefly discussed.

PB-256 433/4GA PC$4.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Standards and Water Quality Information Advisory Committee.
An Approach for Establishing Best Available Technology Economically Achievable (BATEA) under Public Law 92-500 with Applications to the Organics, Synthetics and Plastics Industry.
Final rept.,
Martha Sager, Martin Brossman, and Wesley Eckenfelder. Dec 75, 27p ES/WQIAC-5

Descriptors: *Water pollution abatement, *Industrial wastes, *Technology, Standards, Plastics industry, Organic compounds, Methodology, Economic factors, Public law, Benefit cost analysis.
Identifiers: *Best technology, *Federal Water Pollution Control Act Amendments of 1972, Water pollution standards, Synthetic products.

The Effluent Standards and Water Quality Information Advisory Committee and the Environmental Protection Agency undertook an extensive study effort throughout the summer of 1975 to develop a new approach for establishing Best Available Technology Economically Achievable (BATEA) under PL 92-500. This report presents an overview of the approach developed. The approach effectively establishes the technical and economic information needed as well as providing a systematic method for utilizing the data to assist in establishment of effluent limitations.

PB-256 438/3GA PC$5.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Standards and Water Quality Information Advisory Committee.
First Annual Report. Part I. March 1, 1973 - March 1, 1974.
Final rept.,
Martha Sager, and Martin Brossman. May 74, 112p ES/WQIAC-1-B

Descriptors: *Water pollution abatement, *Organizations, Surveys, Legislation, Effluents, Standards, Operations, Performance evaluation.
Identifiers: Water pollution standards, Effluent Standards and Water Quality Information Advisory Committee.

This is the first annual report of the Effluent Standards and Water Quality Information Advisory Committee (ES&WQIAC) to the Administrator of EPA. The report summarizes the legislative basis and operations of the Committee for the period March 2, 1973 to March 1, 1974. The report consists of two parts, bound separately. The first of the report describes the legislative basis of the Committee, its structure, and its operations. Subsequent chapters provide an overview of the Committee's activities and results achieved.

PB-256 439/1GA PC$6.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Standards and Water Quality Information Advisory Committee.
Second Annual Report. Part I. March 1, 1974 - March 1, 1975.
Final rept.,
Martha Sager, and Martin Brossman. May 75, 134p ES/WQIAC-2-A

Descriptors: *Water pollution abatement, *Organizations, Surveys, Performance evaluation, Legislation, Effluents, Standards, Operations.
Identifiers: Water pollution standards, Effluent Standards and Water Quality Information Advisory Committee.

This is the second annual report of the Effluent Standards and Water Quality Information Advisory Committee (ES&WQIAC) to the Administrator of EPA. The first chapter of Part I of the report describes the legislative basis of the Committee, its structure, and a summary of its activities to March 1, 1975. Subsequent chapters provide an overview of the Committee's activities and results achieved. Many of ES&WQIAC's hearings and workshops were summarized in the Bureau of National Affairs Environmental Reporter and some of these have been included in this report.

PB-256 446/6GA PC$9.25/MF$3.00
Eisenhower Consortium for Western Environmental Forestry Research, Fort Collins, Colo.
Rocky Mountain Environmental Research. Quest for a Future. Problems and Research Priorities in the Rocky Mountain Region.
Final rept.
1975, 293p
Grant NSF-GI-39421
Sponsored in part by Forest Service, Washington, D.C. and Environmental Protection Agency, Washington, D.C. Prepared in cooperation with Utah State Univ., Logan. Committee on Future Environments in the Rocky Mountain Region.

Descriptors: *Environmental impacts, Assessments, Forecasting, Management analysis, Mineral deposits, Mines(Excavations), Human ecology, Technology, Utilization, Land development, Recreation, Rural areas, Economic impact, Structual timber, Forage grasses, Mathematical models, Water resources, Sewage treatment, Watersheds, Irrigation, River basins, Flood control, Desalting, Cloud seeding, Population growth.
Identifiers: Ecosystems, Energy resources, Environmental impact assessments, *Rocky Mountain Region(United States).

Rocky Mountain Environmental Research - Quest for a Future was formed with the purpose of identifying environmental problems and research questions in the Rocky Mountain Region. With accurate research to provide facts, wise management decisions can be made which will preserve our heritage and enhance the Region for future generations. The purpose of the research was the following: Identify and evaluate current and potential problems associated with the growing interaction of people and natural environments in the Region, and determine and establish priorities for the research required to provide the necessary basis for environmentally sound resource managements on public and private lands. Task forces were formed to address several subject areas: Biological resources, human needs and responses, institutional arrangements, mineral and energy resources, recreation and tourism, rural residential development, timber and forage uses, and water resources and uses. Task force leaders were asked to select an interdisciplinary and broad-based committee to determine the state-of-knowledge in each field, the gaps in knowledge, and thus the major needs to be researched. Each leader prepared a documented report of the findings. A draft of each task force report was sent for review and the review comments were incorporated where pertinent into the final reports presented here.

PB-256 462/3GA PC$3.50/MF$3.00
Environmental Protection Agency, Washington, D.C. Quality Assurance Div.
Abbreviated List of Publications and Guideline Documents Dealing with Monitoring Quality Assurance.
Jan 74, 14p

Descriptors: *Air pollution abatement, *Water pollution abatement, *Monitoring, *Bibliographies, Quality assurance, Water quality management, Documents, Pesticides, Radiation.
Identifiers: Air quality maintenance, Environmental Protection Agency.

In response to the Environmental Protection Agency's (EPA) environmental monitoring needs, the Agency's quality assurance program, within the Office of Research and Development, has assembled an abbreviated list of some of the more important documents that deal with monitoring quality assurance. Although this list covers all media, it is by no means exhaustive. It does, however, include many of the more popular documents that have been prepared by various components of EPA. Included, also, are some of the more relevant documents scheduled for future publication by EPA's quality assurance program.

PB-256 500/0GA PC$4.00/MF$3.00
Ekono, Seattle, Wash.
Design and Operation of Aerated Lagoons for Municipal Wastewater Treatment in Cold Climates,
Howard Edde. 29 Mar 72, 36p
Presented at Environmental Protection Agency Technology Transfer Program Design Seminar for Cold Climate Wastewater Treatment, Held at Anchorage, Alaska, on March 28-29, 1972.

Descriptors: *Sewage treatment, *Aeration, *Lagoons(Ponds), *Cold weather construction, *Municipalities, Design criteria, Waste water, Field tests, Oxygenation, Mixing, Military facilities, Ice formation, Biodeterioration, Temperature, Alaska.

The aerated lagoon method of wastewater treatment is primarily a product of the 1960's. The effect of climatic conditions is especially significant in the colder Northern regions where ice problems, which appeared in the first installation treating domestic wastewaters, become serious and have threatened the very

idea of aerated lagoons as a practical method of biological treatment in these climates. The first aerated lagoon in Alaska, constructed in 1967 was located at the Eielson Air Force Base near Fairbanks. By 1970, there were at least 17 aerated lagoons in Alaska. All except one of these units were using perforated tubing diffused aeration for oxygenation and mixing. This aeration method was largely accepted to prevent reoccurrence of the bad icing experiences reported with mechanical surface aeration at other Northern installations. With regard to differences among biological treatment processes operating in cold climates the most important factor from a biological point of view is the effect of temperature upon the rate of biological reactions.

PB-256 511/7GA PC$12.50/MF$3.00
Environmental Protection Agency, Seattle, Wash. Region X.
Wastewater Facilities, Kitsap County, Washington.
Final environmental impact statement.
May 76, 493p EPA/910/9-75/012
Prepared in cooperation with Engineering-Science, Inc., Berkeley, Calif., and Socio-Economic Systems, Inc., Los Angeles, Calif.

Descriptors: *Environmental impact statement-final, *Waste water, *Sewage treatment, *Washington(State), Facilities, Cost analysis, Regions, Water supply, Natural resources, Project planning, Environmental impacts, Counties, Reduction.
Identifiers: *Sewage treatment plants, Kitsap County(Washington), Impact mitigation.

This document is the final Environmental Impact Statement prepared in conjunction with the Central Kitsap County Draft Facilities Plan. The EIS was written as a part of the proposed Kitsap County grant for the construction of interceptor sewer lines, wastewater treatment facility and wastewater disposal facility to service the Trident Submarine Support Site and the Poulsbo drainage basin.

PB-256 539/8GA PC$10.00/MF$3.00
Simi Valley, Calif.
Economic Development Program, City of Simi Valley, California.
Jun 76, 326p EDA-76/017
Grant EDA-07-6-01529
Prepared by Envicom Corp., Sherman Oaks, Calif., and Natelson Co., Inc.

Descriptors: *Economic development, *Municipalities, *Technical assistance, California, Government policies, Projects, Unemployment, Industrial relations, Commerce, Constraints, Demographic surveys, Economic surveys, Trends, Objectives, Urban development.
Identifiers: *Simi Valley(California), Industrially deficient municipalities, Bedroom communities.

This technical assistance was undertaken to determine ways to modify the lack of non-residential development that has contributed to the City's chronically high unemployment rate and dependence upon jobs in the Los Angeles Area. The objectives of this study is to determine the potentials for commercial and industrial development, to prepare action program of specific public policies and programs to pursue these potentials. The principal emphasis is on industrial and commercial uses.

PB-256 555/4GA PC$4.00/MF$3.00
Mississippi State Univ., Mississippi State. Water Resources Research Inst.
The Effects of Variations in Turbidity on Cycles of Planktonic and Benthic Organisms in Flood Control Reservoirs.
Completion rept.,
Y. J. McGaha, John W. Burris, and Charles M. Cooper. Jul 76, 47p W76-11172, , OWRT-A-090-MISS(1)
Prepared in cooperation with Mississippi Univ., University.

Descriptors: *Water pollution, *Turbidity, *Plankton, *Benthos, *Reservoirs, Flood control, Primary biological productivity, Life cycles, Solids, Regression analysis, Limnology, Correlation techniques, Mathematical prediction, Abundance, Mississippi, Tables(Data).
Identifiers: Water pollution effects(Plants), Water pollution effects(Animals), *Grenada Reservoir.

The effects of turbidity on plankton and macrobenthos cycles in four northern Mississippi flood control reservoirs were studied. Turbidity measurements in part per million SiO_2 were analyzed with other concomitant physiochemical data to ascertain the effects of suspended materials on planktonic and benthic cycles in the impoundments. A quantitative plankton analysis was made and 27 of the most abundant genera were entered in a computerized stepwise regression analysis against 20 predictor variables consisting of the physiochemical data. The main emphasis of the benthos study was in Grenada Reservoir, Mississippi.

PB-256 570/3GA PC$3.50/MF$3.00
Oklahoma Agricultural Experiment Station, Stillwater.
Automated Pond Water Treatment Unit.
Technical completion rept.,
Charles E. Rice, James E. Garton, and Larry D. Jarrell. 1976, 21p W76-11340, , OWRT-A-060-OKLA(1)
Prepared in cooperation with Oklahoma State Univ., Stillwater.

Descriptors: *Sewage treatment, *Ponds, *Filtration, *Hams Lake, Pumping, Chlorination, Pressure, Storage tanks, Pumps, Alums, Sand filters, Tables(Data), Diagrams, Flushing, Waste water, Performance evaluation, Oklahoma.
Identifiers: Stillwater(Oklahoma), Water quality data.

An automated pond water treatment unit was designed, constructed and evaluated. It was designed as an exterior unit to be located in the vicinity of a pond or lake. The unit was self-contained and furnished filtered and chlorinated water under pressure. The unit consisted of a pond water pump, chlorine and alum solution containers with metering pumps, a sand filter, a time clock and solenoid for backflushing, storage for treated water and a water pressure pump and storage tank. The sand filter was an upflow type which permitted the floc to settle out and be removed by backflushing. The pond water pump had a capacity of nine gallons per minute (34 liters per minute) and the pressure pump a capacity of about eight gallons per minute (30 liters per minute). The unit was located near Stillwater, Oklahoma at Hams' Lake, a flood detention reservoir that usually had fairly clear water.

PB-256 571/1GA PC$4.00/MF$3.00
University of Southern Mississippi, Hattiesburg. Bureau of Business Research.
Development of Regional Water Management Systems Operational Procedures.
Completion rept.,
David J. Etzold, and D. C. Williams, Jr. Jul 76, 44p W76-11329, , OWRT-A-094-MISS(1)
Prepared in cooperation with Mississippi State Univ., Mississippi State. Water Resources Research Inst.

Descriptors: *Water supply, *Water consumption, *Regional planning, *Mississippi, Organizations, Management, Project planning, State government, Local government, Interviews, Reviews.
Identifiers: *Jackson County(Mississippi), *Institutional framework.

The purpose was to identify multigovernmental constraints inherent in regional water supply development and to generate an organizational and procedural framework. There is some discussion of current water supply problems in southeast Mississippi, in general, and Jackson County, in particular. Governmental agencies with water development and management jurisdiction in Jackson County are identified. Thirteen officials and professionals were interviewed for the purpose of deriving their views on development of a regional water supply system.

PB-256 575/2GA PC$5.00/MF$3.00
Washington State Univ., Pullman. Dept. of Political Science.
Establishing Instream Flows: Analysis of the Policy-Making Process in the Pacific Northwest.
Completion rept. (Final),
Paul L. Beckett, and Berton L. Lamb. 1976, 85p W76-11339, , OWRT-A-077-WASH(3)
Contract DI-14-34-0001-6050

Descriptors: *Water supply, *Water consumption, *Stream flow, Decision making, Water resources, Management, Law(Jurisprudence), Water flow, Policies, Fishes, Washington(State), Oregon, Idaho, Wildlife, Navigation, Recreation, Electric power plants, Esthetics, Water pollution abatement.
Identifiers: Pacific Northwest Region(United States), Instream flow, Water allocation(Policy), Water utilization.

An analysis was conducted of the decision-making process in natural resources management, accomplished through investigation of the establishment of instream flows in the Pacific Northwest. Instream uses of water are those which use the water while it remains in the stream. These uses require water flow for fish and wildlife habitat, navigation, hydro-electric power production, recreation, aesthetics, and waste dilution. A wide variety of agencies of both the federal and state governments is involved in determining policy regarding the amount of water to be left in streams. Four hypotheses are suggested and discussed. First, it is suggested that at the system level decision-making is characterized by bargaining. Second, it is suggested that at the group level decisions are made by muddling through, or incremental reliance on previous policy stands. Third, it is suggested that at the group level policy is made in part through organizational process. That is, agencies rely on a repertoire of procedures to collect and process information; they follow routine. Fourth, it is suggested that at the individual level agency representatives tend to align themselves with others in the same profession, thus mitigating conflicts between agencies.

PB-256 579/4GA PC$4.50/MF$3.00
Wisconsin Univ., Madison. Dept. of Chemistry.
An Investigation of Three Methods for the Determination of Sub-Micromolar Ion Concentrations in Water.
Technical completion rept.,
W. J. Blaedel, G. W. Schieffer, R. A. Niemann, and D. E. Dinwiddie. Jun 76, 53p W76-11331, , OWRT-A-053-WIS(5)
Contracts DI-14-31-0001-4050, DI-14-31-0001-5050
Also pub. as Wisconsin Univ., Madison. Water Resources Center technical rept. no. 76-01.

Descriptors: *Water analysis, *Trace elements, Performance evaluation, Water pollution, Ions, Concentration(Composition), Sensitivity, Electrodes, Design criteria, Ion exchangers, Membranes, Cation, Copper, Equilibrium, Sampling, Reaction kinetics.

Identifiers: *Water pollution detection, Tubular electrodes, *Ion selective electrodes.

Two methods were studied for the sampling, concentration, or determination of trace metal ions at submicromolar levels. (1) Trace ions in a sample donor solution are concentrated by loading upon a pellicular ion exchanger, and these are eluted or stripped into an acceptor solution at an enhanced concentration level so that they can be more easily measured. In studies with Cu(II), enhancements up to 64-fold have been obtained that are in accord with the theoretical Donnan enhancement. Times required are reasonable, being about a half hour for the loading step and about five minutes for the stripping step. Equipment and procedure are being designed to permit estimations of copper ion concentration or activity (speciation) in the field. (2) With sample solution flowing through two tubular electrodes in series, trace metal ions may be deposited cathodically at the upstream electrode, and then stripped off by scanning the upstream electrode toward anodic potentials. With the proper control of conditions, and with the downstream electrode maintained at a constant cathodic potential, collector currents due to metal ions stripped from the upstream electrode can be measured at the downstream electrodes and used for estimating the trace metal ion concentration in the original sample solution.

PB-256 588/5GA PC$5.00/MF$3.00
National Research Council, Washington, D.C. Numerical Data Advisory Board.
Ad Hoc Advisory Panel on Evaluated Physical Property Data in Aid of Aqueous Environmental Problems. Report on Meeting, August 14-15, 1975.
Aug 75, 92p
Sponsored in part by National Bureau of Standards, Washington, D.C. Office of Standard Reference Data.

Descriptors: *Physical properties, *Water pollution, *Chemical properties, Particles, Surface properties, Reaction kinetics, Thermodynamic properties, Chemical reactions, Herbicides, Pesticides, Metal complexes, Radioactivity, Organic compounds, Inorganic compounds, Drinking water, Concentration(Composition), Industrial wastes.

Report on an NAS-NRC Panel discussion of needs for evaluated physical and chemical property data of importance for environmental monitoring and effluent control, for the study of the fate of pollutants and for the establishment of meaningful standards. Systems include both organic and inorganic pollutants in solution and in the presence of particulate matter; properties include analytical, equilibrium, and surface properties.

PB-256 614/9GA PC$5.00/MF$3.00
Wiley and Wilson, Inc., Lynchburg, Va.
Start-up of Municipal Wastewater Treatment Facilities.
Final rept.
Dec 73, 97p EPA/430/9-74-008
Contract EPA-68-01-0341

Descriptors: *Sewage treatment, *Municipalities, Manuals, Standards, Tests, Education, Safety, Manpower, Equipment, Specifications, Construction.
Identifiers: *Sewage treatment plants.

The manual is a guide for putting into initial operation a new municipal wastewater treatment plant, a new addition to an existing plant, or a change in the mode of a plant's operation. Information is given on preparing for actual treatment plant start-up, including; staffing the plant; developing standard operating procedures; establishing procedures when construction is continued during start-up; dry- and wetrun testing of equipment; on-site operator training; and safety training. Start-up procedures are described for some of the more common pre-treatment and primary treatment units. The start-up procedures for advanced wastewater treatment units and processes are beyond the scope of this manual.

PB-256 649/5GA PC$5.50/MF$3.00
Battelle Pacific Northwest Labs., Richland, Wash.
Precipitation Scavenging of Fossil-Fuel Effluents.
Final rept. 24 Jun 74-28 Nov 75,
M. Terry Dana, Dennis R. Drewes, Donald W. Glover, and Jeremy M. Hales. Jun 76, 106p
Contract EPA-68-02-1729

Descriptors: *Plumes, *Air pollution, Combustion products, Scavenging, Mathematical models, Electric power plants, Sulfur dioxide, Experimental design, Particles, Concentration(Composition), Electron microscopes, Coding, Computer programming, Reaction kinetics, Rainfall, Precipitation(Meteorology), Oxidation, Ammonia, Mathematical prediction.
Identifiers: *Precipitation washout, SMICK model, EPAEC model.

A numerical model for predicting the precipitation scavenging of reactive pollutants from power plant plumes has been developed. The model, called SMICK (Scavenging Model Incorporating Chemical Kinetics), calculates collection, liquid-phase chemical reaction, and desorption, if any, of multiple plume-bound pollutants as they interact with falling raindrops and are ultimately deposited on the surface. Calculations for any specific aqueous-phase kinetics mechanism can be performed with the model by expressing the mechanism in appropriate sub-routine form. The model has been tested against field experiment data.

PB-256 656/0GA PC$4.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Standards and Water Quality Information Advisory Committee.
An Analysis of Current and Proposed Federal Legislation Seeking to Control the Use of Toxic Materials.
Final rept.,
Martha Sager, Martin Brossman, and Evelyn Wilcox. Nov 75, 32p ES/WQIAC-4

Descriptors: *Water pollution abatement, *Industrial wastes, *Legislation, Standards, Government policies, National government, Hazardous materials, Control, Guidelines, Planning, Surveys.
Identifiers: Toxic hazards, Water pollution standards.

The establishment of standards for toxic substances discharge from industrial sources is extremely complex due to the wide range of current and proposed legislation related to toxic substances as well as the regulation options available under PL 92-500. Accordingly, an analysis of current and proposed legislation was undertaken to prepare a guidance document which will provide a means for analyzing legislation and standard setting impacts and assist in implementing Sec. 307. The results of this study will be of direct use to the Administrator of EPA as a guide to overlaps or omissions in the regulatory controls over which he has the major responsibility and help delineate and define the mandate of Sec. 307 of PL 92-500. The results of the study are being utilized by ES&WQIAC pursuant to its responsibilities and have already proven of value to Congress in developing the new Toxic Substances Control bill.

PB-256 662/8GA PC$6.75/MF$3.00
Syracuse Research Corp., N.Y. Center for Chemical Hazard Assessment.
Investigation of Selected Potential Environmental Contaminants: Mercaptobenzothiazoles.
Final rept.,
Joseph Santodonato, Leslie N. Davis, Philip H. Howard, and Jitendra Saxena. Jun 76, 160p*
TR-76-502, EPA/560/2-76-006
Contract EPA-68-01-3128
See also PB-252 970.

Descriptors: *Environmental impacts, *Sulfur organic compounds, Transportation, Storage, Benzothiazoles, Elastomers, Industrial wastes, Water pollution, Air pollution, Corrosion inhibitors, Physical properties, Monitoring, Handling, Market value, Chemical properties, Chemical reactions, Photochemical reactions, Hydrolysis, Oxidation, Utilization, Water analysis, Gas analysis, Biodeterioration, Toxicity, Pharmacology, Microorganisms, Biochemistry, Law enforcement, Drinking water.
Identifiers: *Benzothiazole thiols, Carcinogens, Bioaccumulation, Air pollution effects(Humans), Air pollution effects(Animals), Air pollution effects(Plants), Water pollution effects(Plants), Water pollution effects(Humans), Water pollution effects(Animals), Mercaptobenzothiazole/(sodium-salt).

This report reviews the potential environmental hazard from the commercial use of 2-mercaptobenzothiazoles (MBT). Most of the mercaptobenzothiazoles are consumed as rubber accelerators in vulcanization processes, although the sodium salt of MBT is used as a corrosion inhibitor in water-based cooling systems. Information on physical and chemical properties, production methods and quantities, commercial uses and factors affecting environmental contamination, as well as information related to health and biological effects, are reviewed.

PB-256 679/2GA PC$6.00/MF$3.00
ADAPT Service Corp., Reading, Mass.
Effect of Mechanical Cooling Devices on Ambient Salt Concentration.
Final rept. Feb 75-Sep 75,
Herbert E. Hunter. Apr 76, 142p ADAPT-75-8, EPA/600/3-76-034
Contract EPA-68-03-2176

Descriptors: *Air pollution, *Salt water, *Cooling towers, Nuclear power plants, Particles, Airborne, Concentration(Composition), Regression analysis, Statistical data, Wind speed, Samplers, Sprays, Wind direction, Variations, Humidity, Spraying, Tables(Data), Estimates, Background, Optimization, Thermal pollution, Florida.
Identifiers: *Turkey Point Nuclear Power Plant.

The report presents an analysis of the airborne salt concentration data collected during the demonstration of the salt water mechanical cooling devices at the Turkey Point power plant. The data were analyzed using the ADAPT family of empirical analysis programs which are based on the concept that empirical analysis should be preceded by the development of an optimal (in the Karhunen-Loeve sense) representation of the data. The analysis presented in the report shows that the increase in the background salt concentration due to the cooling tower was less than the measurement accuracy of approximately three to five micrograms per cubic meter.

PB-256 688/3GA PC$3.50/MF$3.00
Environmental Monitoring and Support Lab., Research Triangle Park, N.C. Statistical and Technical Analysis Branch.
Coding Manual for the Quality Assurance Performance Audit for Aerometric Data.
Raymond C. Rhodes, and Donald H. Fair. Jan 76, 25p EPA/600/4-76/006

Descriptors: *Quality assurance, *Air pollution, *Data acquisition, Monitoring, Performance evaluation, Particles, Sulfur dioxide, Nitrogen dioxide, Auditing, Manuals.
Identifiers: *National Air Surveillance Networks, Air quality data.

Appendix A of Guideline Document OAQPS 1.2-020, 'Guidance for Decentralization and Continued Operation of the NASN,' provided instructions for performing quality assurance performance audits for the National Air Surveillance Network. This coding manual furnishes detailed coding instructions to those who perform the audits and record the data for transmittal to EPA.

PB-256 694/1GA PC$4.00/MF$3.00
Wisconsin Univ., Madison. Water Resources Center.
Phosphorus Cycling and Luxury Phosphorus Storage by Algae in the Waters of Green Bay.
Technical completion rept.,
Jack C. Norman, and Paul E. Sager. Jul 76, 43p WIS-WRC-76-04, W76-11332, , OWRT-A-059-WIS(1)
Contracts DI-14-31-0001-4050, DI-14-31-0001-5050
Sponsored in part by Contract DI-14-34-0001-6052.

Descriptors: *Water pollution, *Phosphorus cycle, *Algae, *Green Bay, Phytoplankton, Concentration(Composition), Storage, Biomass, Metabolism, Adsorption, Mathematical models, Fox River, Wisconsin.
Identifiers: *Eutrophication, Epilimnion, *Model studies, *Water pollution effects(Plants).

Steep gradients in phosphate and phytoplankton biomass concentrations along a transect extending 15 km into Green Bay from the mouth of the Fox River contrast greatly with apparently uniform phosphorus cycling rates between algae and water in the same area. The luxury storage of phosphorus by algae, expressed on a per unit biomass base, is nearly the same at all stations along the transect and in excess of value thought to indicate phosphorus-limited conditions. It is suggested that similarities in turnover rates of phosphorus per unit biomass algae are due to the availability of phosphate in the water at levels well in excess of limiting concentrations leading to a saturation effect in phosphorus metabolism by the phytoplankton. A modification of Lean's four compartment model of the transfer of phosphorus between soluble and particulate forms in the epilimnion of lakes is necessary to make the model consistent with certain observed transfer curves.

PB-256 696/6GA PC$6.75/MF$3.00
Monsanto Research Corp., Dayton, Ohio.
Technical Manual for Process Sampling Strategies for Organic Materials.
Final rept. Jul 75-Jan 76,
W. Feairheller, P. J. Marn, D. H. Harris, and D. L. Harris. Apr 76, 169p* MRC-DA-512, EPA/600/2-76/122
Contract EPA-68-02-1411

Descriptors: *Organic compounds, *Industrial wastes, *Water analysis, *Gas analysis, Sampling, Particles, Assessments, Chemical analysis, Concentration(Composition), Adsorption, Combustion products, Laboratory equipment, Samplers, Design criteria, Separation, Mass spectrometry, Cyclones, Sources.
Identifiers: In plant processes, Stationary sources, Solid wastes, Fugitive emissions, Point sources.

The manual describes sampling approaches for conducting Level I, II, and III environmental source assessment surveys of the feed, product, and waste streams associated with the production of organic materials. Level I provides large quantities of sample in a short time period for both analysis of the chemical classes of compounds present and biological testing programs. Level II is a more detailed qualitative and quantitative chemical analysis of the organic components. Level III is a quantitative study of the effect of process variables on the emission rates of specific organic materials. The manual: provides specific methods to be used in Level I to obtain samples from stationary sources, fugitive emission sources, and process and waste streams (including gas, liquid, and solid phases); and provides the current state-of-the-art, an extension of the state-of-the-art sampling methods that are available for application to Level II and III studies. The manual is directed to those who are basically experienced in sampling techniques and will be required to apply these methods in source assessment programs.

PB-256 697/4GA PC$5.00/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
IERL-RTP Data Quality Manual.
Final rept. Mar-May 76,
Franklin Smith, and James Buchanan. Jun 76, 97p EPA/600/2-76/159
Contract EPA-68-02-1398

Descriptors: *Pollution, *Research management, *Quality control, *Quality assurance, Quality, Policies, Measurement, Reliability, Methodology, Objectives, Organizations, Projects, Evaluation, Planning.
Identifiers: Industrial Environmental Research Laboratory, Environmental Protection Agency, Research Triangle Park(North Carolina).

The manual gives guidelines for the establishment and maintenance of an integrated data quality program for EPA's Industrial Environmental Research Laboratory--Research Triangle Park (IERL-RTP). Administrative systems dedicated to the data quality program are delineated. These systems include quality policies and objectives, organizational structure and key quality personnel, and a schedule for implementation. Components of both quality control programs and quality assurance programs are given. IERL-RTP projects are divided into six categories. Projects within a given category have common characteristics (e.g., size, duration, objectives, and data quality requirements), making them amenable to the same general set of quality control and quality assurance practices and procedures. Quality control and quality assurance procedures applicable to each of the six categories are given for each phase of the project's life cycle.

PB-256 707/1GA PC$5.00/MF$3.00
Envirex Inc., Milwaukee, Wis. Environmental Sciences Div.
Development of a Mobile Treatment System for Handling Spilled Hazardous Materials.
Final rept.,
Mahendra K. Gupta. Jul 76, 86p EPA/600/2-76-109
Contract EPA-68-01-0099

Descriptors: *Hazardous materials, *Transportation, *Water pollution control, *Chemical compounds, *Mobile equipment, Cleaning, Laboratory tests, Reverse osmosis, Clarification, Filtration, Activated carbon treatment, Chlorination, Ammonia, Acrylonitriles, Nitriles, Chlorinated hydrocarbons, Chlorine, Carbinols, Phenols, Tetraethyl lead, Lead organic compounds, Flocculation, Precipitation(Chemistry).
Identifiers: Hazardous materials spills, *Water pollution control equipment, Transportation safety, Lactonitrile/methyl.

This report documents the results of a laboratory test program undertaken to define the treatment processes for the development of a modular transportable treatment unit for an on-site handling of spilled hazardous materials in aqueous solutions. The hazardous materials evaluated during this study were selected based on the priority ranking system developed by EPA. Nine materials evaluated for treatment by chemical reaction, clarification and activated carbon adsorption were: acetone cyanohydrin, acrylonitrile, ammonia, chlorinated hydrocarbons, chlorine, methanol, phenol, tetraethyllead (TEL) and tetramethyllead (TML). Several additional materials listed in the report were evaluated for treatment feasibility by reverse osmosis. The results of the laboratory tests indicated that the unit treatment processes of chemical reaction, flocculation, sedimentation, granular media filtration and activated carbon adsorption would form the most suitable and versatile system for an on-site removal and treatment of hazardous materials. This treatment vehicle is now ready and available for response to an actual or test spill.

PB-256 709/7GA PC$5.50/MF$3.00
Oklahoma State Univ., Stillwater. School of Mechanical and Aerospace Engineering.
Hydraulic Model Studies of Mechanical Mixing Devices in Stratified Lakes.
Final technical completion rept. 1 Jul 75-30 Jun 76,
P. M. Moretti, and D. K. McLaughlin. 1976, 110p ER-76-ME-2, W76-11495, , OWRT-A-064-OKLA(1)
Prepared in cooperation with Oklahoma Water Resources Research Inst., Stillwater.

Descriptors: *Water pollution, *Stratification, *Jets, *Hams Lake, Design criteria, Mixing, Density(Mass/volume), Model tests, Propellers, Hydraulic models, Velocity measurements, Profiles, Oklahoma, Tables(Data).
Identifiers: *Destratification.

The investigation was undertaken to analyze the effectiveness of devices for artificially destratifying lakes. A criterion for the effectiveness of mixing was selected. This criterion was applied to a number of variations of mechanical mixing devices to indicate trends in optimization of designs. Experiments were performed in a vertically exaggerated scale model of Ham's Lake. Destratification was accomplished by a jet of water from two different sizes of propellers in different configurations (shrouded, skirted, and free; at two depths; and with a deflector) mixing the top water with the bottom water. Data taken from the experiments include density profiles as a function of time. The data were analyzed determining the change of the stability index with time.

PB-256 713/9GA PC$5.50/MF$3.00
California Univ., Davis. Water Resources Center.
Non-Point Source Water Quality Monitoring, Inyo National Forest, 1975.
Progress rept.,
Janet Baas, F. Dane Westerdahl, and Richard L. Perrine. Mar 76, 118p Contrib-156, W76-11492

Descriptors: *Water pollution abatement, *Monitoring, *National parks, Forest land, Sources, Recreation, Wildlife, Temperature, Oxygen, Dissolved gases, pH, Concentration(Composition), Sulfates, Inorganic nitrates, Chlorides, Inorganic phosphates, Bacteria, Algae, Lakes, California.
Identifiers: *Inyo National Forest, *Water quality data, Wilderness areas, Dissolved oxygen.

Results are presented of a study on the impact of non-point sources on water quality in wilderness and recreational areas within the Inyo National Forest. One objective was to assess water quality with regard to physical, chemical and bacteriological parameters in a manner permitting evaluation of area-wide sources. A

second objective was to develop improved test methods for continuing water quality monitoring and protection in such areas. A monitoring program was conducted, in which 34 sites, selected by the U.S. Forest Service, were sampled one or more times during the summer and fall of 1975.

PB-256 729-T/GA PC$9.75/MF$3.00
Bureau of Reclamation, Washington, D.C.
Hydrological Field Investigations for Designing Hydroelectric Powerplants,
Ya. L. Gotlib, I. A. Kuzmin, F. F. Razzorenov, and N. M. Sokolnikov. 1976, 310p TT-74-52003
Trans. of mono. Naturnye Gidrologicheskie Issledovaniya pri Proektirovanii GES, Leningrad, 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Channel flow, *Reservoirs, *Electric power plants, Design criteria, Construction, Hydraulic models, Channel improvements, Ice, Mathematical models, Thermal conductivity, Books, Erosion control, Alluvium, Dams, Flood control, Translations, USSR, Hydrology, Thermal pollution.

This book deals with the problems of full-scale hydrological field investigations made in the course of designing, construction and operation of hydroelectric power stations. Studies of flow hydraulics, river channel flow processes, thermal and icebound conditions are considered. The experience gained by the 'Hydroproject' Institute during full-scale field investigations is also discussed. Copyright (c) 1976 Amerind Publishing Co.

PB-256 739/4GA PC$4.50/MF$3.00
Idaho Research Foundation, Inc., Moscow.
Multiple Objectives Planning Water Resources. Volume 1. Natural Resources Series Number 5,
Edgar L. Michalson, Ernest A. Englebert, Wade Andrews, and Charles R. Stratton. 1974, 66p W76-11173, , OWRT-X-142(4259)(1)
Proceedings of the UCOWR Workshop on Multiple Objective Planning and Decision-Making, Held at Las Vegas, Nevada on July 16-18, 1974. See also PB-256 740.

Descriptors: *Water resources, *Project planning, *Meetings, Decision making, Research projects, National government, Universities, Economic development, River basin development, Soil conservation, Fishes, Construction, Land reclamation, Wildlife, Nevada.
Identifiers: *Multiple purpose projects.

The workshop originated as an effort on the part of the Committee for Education and Research in the Social Sciences of the Universities Council on Water Resources. During the 1972 UCOWR annual meeting a task force was established to identify research topics and problems related to multiple objective planning and decision making. The workshop itself was designed to provide a means of exchange between federal agency planners and university researchers. Agency planners -- through position papers -- provided basic input to use in multiple objective planning.

PB-256 740/2GA PC$6.00/MF$3.00
Idaho Research Foundation, Inc., Moscow.
Multiple Objectives Planning Water Resources. Volume 2. Natural Resources Series Number 5,
Edgar L. Michalson, Ernest A. Engelbert, Wade Andrews, and Charles R. Stratton. 1975, 127p W76-11174, , OWRT-X-142(4259)(2)
Proceedings of the UCOWR Conference on Multiple Objective Planning and Decision-Making, Held at Boise, Idaho January 14-16, 1975. See also PB-256 739.

Descriptors: *Water resources, *Project planning, *Meetings, Reviews, Decision making, Land use, Policies, River basin development, Public opinion, Social effect, Universities, National government, Environmental impacts, Objectives, Ecology, Cost analysis, Economic impact, Standards, Wildlife, Idaho.
Identifiers: *Multiple purpose projects.

The conference discussed was a result of efforts by the Committee for Education Research in the Social Sciences of the Universities Council on Water Resources. During the 1972 UCOWR annual meeting, a task group was established to identify research topics and problems related to multiple objective planning and decision making. At the 1973 UCOWR annual meeting, a resolution was passed calling for a national Workshop-Conference on the topic. The Conference was designed to allow the university people to present their ideas for public discussion by federal agency planners: The present volume contains the Conference papers, together with summaries of the discussion and panels.

PB-256 759/2GA PC$6.75/MF$3.00
Mississippi Marine Resources Council, Long Beach.
Public Meeting Series on Coastal Zone Boundaries.
Feb 76, 172p MASGP-76-017, NOAA-76052101
Sponsored in part by Mississippi-Alabama Sea Grant Consortium, Ocean Springs, Miss.

Descriptors: *Coastal zone management, *Meetings, Boundaries, Land use zoning, River basin development, Urban areas, Proposals, Public opinion, Reviews, Land development, Mississippi, Alabama.
Identifiers: Sea Grant program, Coastal Wetlands Protection Act.

The report is a transcript of conferences held by the Mississippi-Alabama Sea Grant Consortium in different cities of Mississippi to discuss coastal zone boundaries. The agenda includes the following: Opening remarks; introduction slide presentation; review of boundary proposals; questions, comments, and statements from the audience; and meeting participants list.

PB-256 760/0GA PC$3.50/MF$3.00
Arizona Univ., Tucson. School of Renewable Natural Resources.
Water Quality of Streamflow from Ponderosa Pine Forest Watersheds on Sedimentary Soils.
Technical completion rept.,
F. Ffolliott. Aug 76, 7p W76-11490, , OWRT-A-066-ARIZ(2)
Contract DI-14-34-0001-6003

Descriptors: *Stream pollution, *Forest land, *Pine trees, *Residual soils, Statistical analysis, Watersheds, Concentration(Composition), Physical properties, Bacteria, Water quality, Runoff, Calcium, Magnesium, Sodium, Carbonates, Fluorides, Sulfates, Inorganic nitrates, Inorganic phosphates, Chlorides, pH, Arizona.
Identifiers: *Forest watersheds, *Water quality data.

Water samples were collected weekly and at times of unusual hydrological events from 4 ponderosa pine watersheds on sedimentary soils to: (1) Examine the chemical, physical, and Bacteriological characteristics; (2) Explore the empirical association of these water quality parameters with land use patterns; and (3) Analyze the interactions among these parameters. In each sample, calcium, magnesium, and sodium were measured using atomic absorption spectrophotometry; carbonate and bicarbonate were measured by titrating with standard acid; and fluoride, sulfate, nitrate, phosphate (in a limited number of samples), and chloride amounts were determined by colorimetric methods using an Autoanalyzer. Hydrogen ion concentrations were measured using a glass electrode; suspended sediment concentrations were determined by filtration; and the presence of fecal coliform was determined using the membrane filter technique. Statistical analyses indicated no significant differences between water quality parameters among the four watersheds.

PB-256 768/3GA PC$9.25/MF$3.00
Arizona Univ., Tucson. Dept. of Soils, Water and Engineering.
Residual Management by Land Disposal. Proceedings of the Hazardous Waste Research Symposium Held at Tucson, Arizona on February 2, 3, and 4, 1976,
Wallace H. Fuller. Jul 76, 280p* EPA/600/9-76-015
Grant EP-804330

Descriptors: *Solid waste disposal, *Refuse disposal, *Hazardous materials, *Sanitary landfills, *Water pollution abatement, Meetings, Ground water, Industrial wastes, Trace elements, Leaching, Collection, Transport properties, Field tests, Encapsulating, Underground storage, Sludge disposal, Air pollution, Organic compounds, Pesticides, Soil properties, Permeability, Management planning.
Identifiers: Water pollution sampling, Oil wastes.

A research symposium was held to exchange recent information on land disposal of municipal and hazardous wastes. Papers were presented and compiled into a report on the following topics: (1) Case studies of actual and potential environmental impact from land disposal of hazardous wastes; (2) Technology of preventing adverse environmental impact; (3) Selection of disposal sites to minimize adverse impact; (4) Ameliorating damages at existing disposal sites and suggested modification of future sites and wastestreams; (5) Identification of pollution potential of selected industrial solid wastes, and (6) Special disposal problems.

PB-256 808/7GA PC$9.00/MF$3.00
California Univ., Davis. Water Resources Center.
Proceedings Biennial Conference (10th) on Ground Water, Total Water Management for California's Long-Range Needs, Held at Ventura, California on September 11-12, 1975.
Dec 75, 274p 33, W76-11491
Sponsored in part by California State Dept. of Water Resources, Sacramento.

Descriptors: *Ground water, *Water quality management, *Meetings, Water supply, Waste water reuse, Water consumption, Water conservation, Law(Jurisprudence), Regulations, Economic factors, Demand(Economics), Supply(Economics), Fuels, California.
Identifiers: *Water management(Applied).

The conference, co-sponsored by the California Dept. of Water Resources and the California Water Resources Center, included papers under the following session topics: Innovation in Conjunctive Use of Ground and Surface Water; Ground Water Conservation, Protection and Use--Some Technical and Institutional Considerations; Energy and Economic Considerations in the Use and Development of Ground Water; and Legal and Regulatory Aspects.

PB-256 839/2GA PC$7.75/MF$3.00
Atlantic Research Corp., Alexandria, Va.
Investigation of Selected Potential Environmental Contaminants: Formaldehyde.
Final technical rept.,

Judith F. Kitchens, Robert E. Casner, Gordon S. Edwards, William E. Harward, III, and Bruno J. Macri. Aug 76, 217p* 49-5681, EPA/560/2-76/009
Contract EPA-68-01-1955
See also report dated Nov 75, PB-248 634.

Descriptors: *Formaldehyde, *Pollution, *Environmental surveys, *Toxicology, Water pollution, Hexamethylenetetramine, Polymers, Chemical properties, Materials handlings, Public health, Manufacturing, Combustion products, Storage, Sources, Monitoring, Chemical analysis, Microorganisms, Humans, Birds, Plants(Botany), Carcinogens, Animals, Reviews, Industrial hygiene, Physiological effects, Aldehyde polymers, Air pollution, Oxygen heterocyclic compounds, Regulations, Law enforcement, Photochemistry, Waste disposal, Industrial wastes, Exhaust emissions, Degradation.
Identifiers: Point sources, Nonpoint sources, *Air pollution effects(Humans), *Air pollution effects(Animals), *Air pollution effects(Plants), Trioxanes, Occupational safety and health.

This report reviews the potential environmental hazards of formaldehyde resulting from its manufacture, use, production from combustion processes and inadvertent production in the environment. Nascent sources of formaldehyde, such as paraformaldehyde, trioxane and hexamethylenetetramine, are also reviewed. The major source of atmospheric discharge of formaldehyde is combustion processes, specifically from automobile emissions. Formaldehyde is also a product of atmospheric photooxidation of hydrocarbons emitted from automobiles. Photochemical degradation of formaldehyde also occurs in the atmosphere. Formaldehyde is a mutagen is lower animals such as Drosophila and bacteria. This property is the basis of its use as a fumigant. Even though formaldehyde is a strong alkylating agent, information to date indicates that it is not mutagenic or carcinogenic in mammals, probably due to the mammalian body's ability to repair this type of nucleic acid damage. Formaldehyde is an allergen. It is also highly toxic in low concentrations causing eye and lung damage and affecting the central nervous system. However, formaldehyde is also a metabolite in biological systems and can be efficiently metabolized to formic acid, carbon dioxide and water, or utilized in the one carbon pool.

PB-256 840/0GA PC$12.75/MF$3.00
Environmental Protection Agency, Washington, D.C. Effluent Guidelines Div.
Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Fish Meal, Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Fish and Seafood Processing Industry Point Source Category.
Final rept.,
Elwood H. Forsht. Sep 75, 503p* EPA/440/1-75/041a

Descriptors: *Seafood, *Water pollution control, *Food processing, *Industrial waste treatment, Fishes, Industrial waste treatment, Canneries, Bibliographies, Cost estimates, Performance evaluation, Fish protein concentrates, Salmon, Herring, Clams, Shellfish, Process charting, Effluents, Chemical removal(Water treatment), Standards, Economic aspects, Gastropoda, Tables(Data), Materials recovery, Chemical analysis, Mollusca.
Identifiers: Inplant processes, *Water Pollution Control Act Amendments of 1972, Sardines, Point sources, Scallops, Abalone, *Best technology.

This document presents the findings of an extensive study of the fish meal, salmon, bottom fish, clam, oyster, sardine, scallop, herring, and abalone segment of the canned and preserved fish and seafood processing industry of the United States to develop effluent limitations for point source and new source standards of performance in order to implement Sections 304(b) and 306 of the Federal Water Pollution Control Act Amendments of 1972 (the Act). Effluent limitations are set forth for the degree of effluent reduction attainable through the application of the 'Best Practicable Contrl Technology Currently Available' and the 'Best Available Technology Economically Achievable' which must be achieved by existing point sources by July 1, 1977 and July 1, 1983 respectively. The 'Standards of Performance for New Sources' set forth a degree of effluent reduction which is achievable through the application of the best available demonstrated control technology, processes, operating methods or other alternatives. The regulations are based on the best identified primary or physical-chemical treatment technology currently available for discharge into navigable water bodies by July 1, 1977 and for new source performance standards. This technology is generally represented by fine screens and air flotation. The regulations for July 1, 1983 are based on the best identified physical-chemical and secondary treatment and inplant control as represented by significantly reduced water use and enhanced treatment efficiencies in existing systems, as well as new systems. This technology is generally represented by air flotation, aerated lagoons, or activated sludge. Supportive data and rationale for development of the effluent limitations and standards of performance are contained in this report.

PB-256 856/6GA PC$4.00/MF$3.00
Geological Survey, Menlo Park, Calif. Water Resources Div.
Sources of Arsenic in Streams Tributary to Lake Crowley, California.
Final rept.,
Lawrence A. Eccles. Jun 76, 45p
USGS/WRD/WRI-76/060, USGS/WRI-76-36

Descriptors: *Water pollution, *Arsenic, *Springs(Water), *Lake Crowley, Surveys, Seepage, Water supply, Salinity, Stream flow, Concentration(Composition), Craters, Geothermy, Heating, Sources, Hot Creek, California, Long Valley.
Identifiers: *Hot springs.

Water from hot springs in Long Valley is the largest source of arsenic entering Lake Crowley which supplies more than 50 percent of the water entering the Los Angeles-Owens River aqueduct. Seepage-salinity surveys were used to locate and evaluate the major, arsenic-contributing sources. About 60 percent of the arsenic discharged to Lake Crowley is from spring orifices submerged in the channel of Hot Creek at Hot Creek Gorge. Some hot spring water contains in excess of 1,000 micrograms per litre of arsenic. It blends with water flowing in the creek and is diluted to about 200 micrograms per litre. The source of arsenic to the hot springs is attributed to the geothermal activity underlying Long Valley, which is described as a collapsed caldera.

PB-256 893/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
The Role of Standard Reference Materials in Environmental Measurements.
Final rept.,
J. R. McNesby. 1976, 5p
Pub. in Proceedings of National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, D.C., February 9-11, 1976, Report Number 600/778-002, p58-60 (U.S. Environmental Protection Agency, Washington, D.C.) 1976.

Descriptors: *Air pollution, *Water pollution, Industrial wastes, Exhaust emissions, Public health, Electric power plants, Coal gasification, Oil shale, Coal liquefaction, Geothermal energy, Concentration(Composition), Mercury, Sulfur dioxide, Nitrogen dioxide, Carbon monoxide.
Identifiers: *Standard reference materials.

The rationale for the importance of accurate as well as precise environmental measurement is presented. The role of Standard Reference Materials is to provide the analyst with NBS certified samples to facilitate his ability to make accurate measurement. Available energy related Standard Reference Materials are listed and those expected to be developed along with target dates are tabulated.

PB-256 900/2GA PC$4.50/MF$3.00
Transit Development Corp., Inc., Washington, D.C.
Impact of Arterial Bus Priority Treatments on Bus Operating Costs.
Final rept.,
Michael S. Hirsh. Sep 75, 67p TDC-BUS-75-1

Descriptors: *Urban transportation, *Buses(Vehicles), *Traffic engineering, *Operating costs, Central city, Streets, Benefit cost analysis, Urban areas, Traffic engineering, Cost effectiveness, District of Columbia.
Identifiers: *Bus priority systems, Bus priority lanes, Exclusive bus lanes.

A study was conducted to ascertain whether or not an arterial bus priority treatment affects the cost of bus operations. Arterial priority treatments were evaluated for the effectiveness of operations within the Central Business District. Bus operating costs affected by the benefits of an arterial priority treatment were discussed. A case study using the Benning Line of the Washington Metropolitan Area Transit Auth. Metrobus System was then undertaken to illustrate the impact of the arterial priority treatment upon bus operating costs. The results indicate a potential for significant savings in bus operating costs. Briefly, the results show an annual savings of approximately $8,800 due to the implementation of a priority treatment along one mile of an arterial in downtown Washington, D.C. This compared to an arterial priority treatment capital cost of about $10,000 per mile.

PB-256 902/8GA
Mag Tape $300.00;Foreign $375.00
Geological Survey, Denver, Colo. Water Resources Div.
A Model for Calculating Effects of Liquid Waste Disposal in Deep Saline Aquifers.
Model-Simulation,
David B. Grove. Jun 76, mag tape* USGS/WRI-76-61, DOI/DF-76/009
Source tape is in BCD character set. Tape(s) can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB-256 903.

Descriptors: *Models - Simulation, *Solid waste disposal, *Injection wells, *Water pollution, *Aquifers, Ground water, Pressure, Mass transfer, Design, Fluid flow, Convection, Finite element analysis, Salinity, Deep wells, Computerized simulation, Mathematical models, Magnetic tapes, FORTRAN.
Identifiers: IBM-370/155 computers.

A transient, three-dimensional subsurface waste-disposal model has been developed to provide methodology to design and test waste-disposal systems. The model is a finite-difference solution to the pressure, energy, and mass-transport equations. Equation parameters such as viscosity and density are allowed to

be functions of the equations' dependent variables. Multiple user options allow the choice of x, y, and z cartesian or r and z radial coordinates, various finite-difference methods, iterative and direct matrix solution techniques, restart options, and various provisions for output display. The addition of well-bore heat and pressure-loss calculations to the model makes available to the ground-water hydrologist the most recent advances from the oil and gas reservoir engineering field...Software Description: The program is written in the FORTRAN programming language for implementation on an IBM 370/155 computer using the OS Version 21.8, HASP-MVT level operating system. 172K bytes of core storage are required to operate the model.

PB-256 903/6GA PC$9.00/MF$3.00
INTERCOMP Resource Development and Engineering, Inc., Houston, Tex.
A Model for Calculating Effects of Liquid Waste Disposal in Deep Saline Aquifer. Part I - Development. Part II - Documentation.
Final rept.
Jun 76, 265p* USGS/WRI-76-61, USGS/WRD/WRI-76/056, DOI/DF-76/009a
Contract DI-14-08-0001-14703
For system on magnetic tape, see PB-256 902.

Descriptors: *Solid waste disposal, *Injection wells, *Water pollution, *Aquifers, Ground water, Pressure, Mass transfer, Design, Fluid flow, Convection, Finite element analysis, Salinity, Deep wells, Computerized simulation, Mathematical models, Computer programming, FORTRAN.
Identifiers: Liquid waste disposal, FORTRAN 4 programming language.

A transient, three-dimensional subsurface waste-disposal model has been developed to provide methodology to design and test waste-disposal systems. The model is a finite-difference solution to the pressure, energy, and mass-transport equations. Equation parameters such as viscosity and density are allowed to be functions of the equations' dependent variables. Multiple user options allow the choice of x, y, and z cartesian or r and z radial coordinates, various finite-difference methods, iterative and direct matrix solution techniques, restart options, and various provisions for output display. The addition of well-bore heat and pressure-loss calculations to the model makes available to the ground-water hydrologist the most recent advances from the oil and gas reservoir engineering field.

PB-256 921/8GA PC$8.00/MF$3.00
TRW Systems Group, Redondo Beach, Calif.
Hazardous Waste Disposal Program, Sixth Monthly Report.
10 Jul 72, 240p TRW-21485-6006-TO-00
Contract EPA-68-03-0089
See also PB-256 369.

Descriptors: *Solid waste disposal, *Hazardous materials, *Industrial wastes, *Management planning, Classification, Chemical industry, Fluorides, Barium inorganic compounds, Organic compounds, Arsenic, Chromium, Pesticides, Cyanides, Halogen organic compounds, Sodium azides, Lead organic compounds, Tetraethyl lead, Military chemical agents, Nitrogen mustards, Sanitary landfills, Toxicity, Storage, Transportation, Pyrolysis, Materials handling, Government policies.
Identifiers: Ocean waste disposal, Liquid waste disposal, National Disposal Sites, Pyrolysis incineration.

The program is divided into six major tasks consisting of: Defining adequate waste management; Evaluating presently employed waste management techniques or policies and making recommendations as to adequacy; Performing field surveys and verification experiments on existing management procedures; Defining, planning and outlining research programs where necessary for elimination of hazards; Conducting proof-of-principle experimentation on the most promising concepts; and Correlating total program effort. During the last month first draft profile reports for 45 compounds were completed. 37 compounds were scheduled. The reports completed during June are as follows: ammonium fluoride, ammonium bifluoride, potassium fluoride, potassium bifluoride, sodium fluoride, sodium bifluoride; antimony pentafluoride and antimony trifluoride; barium compounds: barium carbonate, barium chloride, barium cyamide, barium nitrate, barium sulfide; benzyl chloride; diborane, tetraborane, pentaborane-9, pentaborane-11, hexaborane, decarborane; calcium arsenite, copper aceloarsenite, lead arsenite, potassium arsenite, zinc arsenite; chloropicrin; chrome; chromic acid; 2,4-D; dinitro cresol; ethylene bromide, methyl bromide, methyl chloride; hydrazine; hydrocyanic acid, hydrogen cyanide; mercuric cyanide; nitrochlorobenzene; nitrogen mustards; sodium azide; tetraethyl and tetramethyl lead.

PB-256 923/4GA PC$5.00/MF$3.00
Battelle Pacific Northwest Labs., Richland, Wash.
A Water Quality Model for the South Platte River Basin.
Documentation rept.,
William W. Waddel, Charles R. Cole, and Robert G. Baca. Apr 74, 100p
Contract EPA-68-01-0702

Descriptors: *Water pollution, *South Platte River Basin, Water quality, Mathematical models, Phosphorus, Coliform bacteria, Nitrogen, Biochemical oxygen demand, Algae, Oxygen, Mathematical prediction, Dissolved gases, Stream flow, Regression analysis, Winter.
Identifiers: *Water quality data, Dissolved oxygen.

The water quality model PIONEER-I is a steady-state program that simulates the behavior of the following water quality parameters: Total nitrogen; Total dissolved solids; Zinc; Dissolved oxygen; Carbonaceous biochemical oxygen demand; Fecal coliform bacteria; Phosphorus; Ammonia; Nitrite; Nitrate; Chlorophyll a. The model was set up on the entire length of the South Platte River from Eleven Mile Canyon Reservoir to its confluence with the North Platte River.

PB-256 926/7GA PC$4.00/MF$3.00
Bureau of Solid Waste Management, Cincinnati, Ohio.
Report on a Study of the Weber County Incinerator in Ogden, Utah.
Open file rept.,
Jerry E. Ongerth, and Morris G. Tucker. 1970, 50p TO-3.1.001/8

Descriptors: *Solid waste disposal, *Incinerators, *Air pollution abatement, Design, Sampling, Combustion, Residues, Fly ash, Flue gases, Chemical analysis, Scrubbers, Measuring instruments, Instrumentation, Burning rate, Laboratory equipment, Cost analysis, Utah.
Identifiers: Air pollution sampling, Ogden(Utah).

An incinerator discharges effluents into the environment in three states: solid, liquid, and gaseous. The sources of these effluents are the processes of combustion, gas cleaning, and residue quenching. Any determination of the pollution contribution to the environment by incineration must be concerned with all these effluents. The Bureau of Solid Waste Management has initiated a program to characterize the performance of incinerators of different designs and configurations. The primary objectives of this program are to produce basic information that identifies the results of the incineration process and to develop reliable sampling methodology. The Weber County Incinerator at Ogden, Utah is designed to handle 300 tons per 24 hour day of solid waste with a gross heating value of 5000 Btu per pound. During the period of this study the furnaces burned an average of 5.7 tons of solid waste per hour per furnace or 91 percent of the design rate.

PB-256 928/3GA PC$5.00/MF$3.00
Bureau of Solid Waste Management, Rockville, Md.
Continental Margin Data Collection Pilot Project.
Open-file rept.,
Sonja Schuyler, and George Heimerdinger. 1970, 83p CT-02-69-45
Prepared in cooperation with National Oceanographic Data Center, Washington, D.C.

Descriptors: *Oceanographic data, *Continental shelves, *Solid waste disposal, Data processing, Submarine topographic features, Information retrieval, Marine biology, Marine geology, Fishing, Bathymetry, Sediments, Delaware, Coasts, New Jersey, California.

The interest shown by coastal metropolitan centers in the disposal of waste materials on the U.S. continental margins has initiated action by several Federal agencies to determine the information available concerning U.S. coastal waters. A study was conducted to determine the amount and availability of oceanographic data for the continental margins of the United States and also to summarize or display the oceanographic data in a form that could be used by the Bureau for quick reference purposes. The ultimate objective is to be able to answer, on short notice, the questions as to whether a particular area is suitable for disposal of solid waste.

PB-256 932/5GA PC$5.50/MF$3.00
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
EXPLORE-I: A River Basin Water Quality Model,
Robert G. Baca, William W. Waddel, Charles R. Cole, Albin Brandstetter, and Dennis B. Cearlock. Aug 73, 124p BNW-211B00557
Contract EPA-68-01-0056
See also Appendix A, PB-256 933.

Descriptors: *Water pollution, *River basin development, *Project planning, Water quality, Biochemical oxygen demand, Hydraulic models, Plankton, Hydrodynamics, Mathematical prediction, Stratification, Open channel flow, Toxicity, Washington(State), Willamette River Basin.
Identifiers: *Water quality data, EXPLORE 1 computer program.

Battelle-Northwest has developed a comprehensive mathematical water quality model, EXPLORE-I, for use in river basin planning and water resource studies. This generalized river basin water quality model can predict the hydrodynamics and water quality dynamics for rivers, well mixed estuaries, and thermally stratified reservoirs. The model has been set up, calibrated, and verified, using historical hydraulic and water quality data, on a portion of the Willamette River Basin consisting of major tributaries and a thermally stratified reservoir.

PB-256 933/3GA PC$5.00/MF$3.00
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
Literature Review for EXPLORE-I: A River Basin Water Quality Model. Appendix A,
Robert G. Baca, William W. Waddel, Charles R. Cole, Albin Brandstetter, and Dennis B. Cearlock. Aug 73, 91p BNW-211B00557-App-A

Contract EPA-68-01-0056
See also Appendix B, PB-256 934 and PB-256 932.

Descriptors: *Water pollution, *River basin development, *Project planning, Water quality, Mathematical models, Reviews, Biochemical oxygen demand, Hydrodynamics, Stratification, Hydraulic models, Benthos, Dissolved gases, Algae, Carbon, Oxygen, Toxicity, Equations.
Identifiers: EXPLORE 1 computer program.

The Appendix to 'EXPLORE-I: A River Basin Water Quality Model' contains a comprehensive review of various water quality submodels, river and estuary hydrodynamic models, and deep reservoir hydrothermal models. The water quality submodels identified in this work are the result of an extensive literature survey of over three hundred seventy published articles and books.

PB-256 934/1GA PC$5.50/MF$3.00
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
User's Manual for EXPLORE-I: A River Basin Water Quality Model. Appendix B,
Robert G. Baca, William W. Waddel, Charles R. Cole, Albin Brandstetter, and Dennis B. Cearlock. Aug 73, 104p BNW-211B00557-App-B
Contract EPA-68-01-0056
See also Appendix A, PB-256 933, and Appendix C, PB-256 935.

Descriptors: *Water pollution, *River basin development, Computer programs, Water quality, Mathematical models, Hydraulic models, Streamflow, Waste disposal, Sewage treatment.
Identifiers: EXPLORE 1 computer program.

EXPLORE-I, the Battelle-Northwest water quality model, is a computer program which simulates the dynamic hydraulic and water quality characteristics of a river basin. It can be used to study the effects of various flow conditions, waste discharge and treatment schemes on the water quality levels of lakes, reservoirs, streams, and rivers. This User's Manual provides the information needed for setting up and analyzing a river basin. Descriptions of the models and their use are also provided.

PB-256 935/8GA PC$9.25/MF$3.00
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
Programmer's Manual for EXPLORE-I: A River Basin Water Quality Model. Appendix C,
Robert G. Baca, William W. Waddel, Charles R. Cole, Albin Brandstetter, and Dennis B. Cearlock. Aug 73, 291p BNW-211B00557-App-C
Contract EPA-68-01-0056
See also Appendix B, PB-256 934.

Descriptors: *Water pollution, *River basin development, Manuals, Water quality, Hydraulic models, Coding, Flow charting, Computer programming, Stratification, Mathematical models, Tables(Data), Subroutines.
Identifiers: EXPLORE 1 computer program.

EXPLORE-I, the Battelle-Northwest water quality model, is a computer program which simulates the dynamic hydraulic and water quality characteristics of a river basin. It can be used to study the effects of various flow conditions, waste discharge and treatment schemes on the water quality levels of lakes, reservoirs, streams, and rivers. This Programmer's Manual provides the basic programming requirements of the EXPLORE-I codes. Included are flow diagrams, variable definition tables, program listings and brief descriptions of the main subroutines. Portions of this document are not fully legible.

PB-256 936/6GA PC$8.00/MF$3.00
National Field Investigations Center-Denver, Colo.
Water Quality and Waste Source Investigations, Missouri River and Papillion Creek, Omaha, Nebraska.
Mar 73, 241p
Prepared in cooperation with Environmental Protection Agency, Kansas City, Mo. Region VII.

Descriptors: *Water quality management, *Water pollution abatement, *Missouri River, *Papillion Creek, Surveys, Municipalities, Industries, Sewers, Diverting, Sewage treatment, Industrial waste treatment, Sewage, Industrial wastes, Law enforcement, Nebraska, Iowa, Kansas, Missouri.
Identifiers: Water quality data, Omaha(Nebraska).

The Environmental Protection Agency, Region VII, requested water-quality investigations in the Missouri River Basin (Omaha Area). These studies, conducted during the period of 30 July to 12 August 1972, included an evaluation of municipal and industrial wastewater treatment facilities and limited stream surveys on the Missouri River and Papillion Creek to determine the impact of waste loads on the quality of the receiving waters.

PB-256 939/0GA PC$5.00/MF$3.00
National Field Investigations Center-Denver, Colo.
Remote Sensing Study of Steam-Electric Power Plant Thermal Discharges to Lake Erie, Detroit and St. Clair Rivers, Ohio and Michigan.
Mar 74, 98p
Prepared in cooperation with Environmental Protection Agency, Chicago, Ill. Region V.

Descriptors: *Electric power plants, *Water pollution, *Thermal pollution, *Steam power plants, Lake Erie, Detroit River, Saint Clair River, Ohio, Michigan, Remote sensing, Spaceborne photography, Maps, Photographs.

An airborne remote sensing study of thermal discharges to Lake Erie and the Detroit and St. Clair Rivers was conducted on 9 July 1973. The study area encompassed the southern shore of Lake Erie from about 5 km (3 mi) east of Ashtabula, Ohio, to Toledo (Maumee Bay), Ohio, and the western shore of Lake Erie from Toledo to the mouth of the Detroit River. The western shores of the Detroit and St. Clair Rivers were also included in the study area. Thermal infrared imagery of the entire study area was obtained using infrared line scanners mounted in high performance reconnaissance aircraft. Ground measurements of water temperatures were made at most of the power plants. This imagery and the ground truth water temperature data were used to characterize the observed thermal fields or plumes.

PB-256 940/8GA PC$4.50/MF$3.00
Bureau of Solid Waste Management, Cincinnati, Ohio.
A Report on the Hartsfield Incinerator Study,
Leland E. Daniels. 1970, 64p BSWM-SW-30ts.of

Descriptors: *Solid waste disposal, *Incinerators, *Air pollution, *Water pollution, Performance evaluation, Residues, Gas sampling, Flue gases, Design, Fly ash, Combustion, Enthalpy, Cost estimates, Capitalized costs, Operating costs, Management planning, Bioassay.
Identifiers: Air pollution sampling.

The Bureau of Solid Waste Management, has initiated a testing program to characterize the performance of incinerators of different designs and configurations. The primary objectives of this program are to produce basic information that identifies the results of the incineration process and to develop reliable sampling methodology. A rotary kiln incinerator was tested to develop basic information pertaining to the operation of the incinerator and its potential impact on the surrounding environment. The study was conducted during the week of December 9 to 13, 1968.

PB-256 941-T/GA PC$3.50/MF$3.00
American Library Association, Chicago, Ill.
Special Collections of United States Environmental Protection Agency Libraries.
Sep 72, 14p
Trans. from various journals.

Descriptors: *Air pollution abatement, *Water pollution abatement, *Documents, USSR, Organic wastes, Estuaries, Pesticides, Public health, Aquatic biology, Nuclear radiation, River basins, Rivers, United States, Translations.
Identifiers: Environmental Protection Agency.

The report cites several library collections of references on environmental pollution and its control.

PB-256 942/4GA PC$3.50/MF$3.00
Environmental Protection Agency, Washington, D.C.
The Importance of Local Initiative in Environmental Management,
Robert W. Fri. 1974, 16p

Descriptors: *Abatement, *Awards, Surveys, Objectives, Operations, Expectation, Air pollution abatement, Water pollution abatement, Planning, Legislation, Urban areas, Licenses, Participative management.
Identifiers: Environmental management.

The report contains remarks made at a 1973 environmental improvement award dinner in Birmingham, Alabama, by the Acting Administrator of the Environmental Protection Agency.

PB-256 950/7GA PC$4.00/MF$3.00
National Environmental Research Center, Research Triangle Park, N.C. Chemistry and Physics Lab.
Effects of Reduced Use of Lead in Gasoline on Vehicle Emissions and Photochemical Reactivity,
A. P. Altshuller. Feb 72, 31p

Descriptors: *Lead(Metal), *Fuel additives, *Air pollution control, Exhaust emissions, Photochemical reactions, Gasoline, Concentration(Composition), Aromatic polynuclear hydrocarbons, Oxidants, Public health, Aerosols, Plants(Botany).
Identifiers: Air pollution effects(Plants), Air pollution effects(Humans), Atmospheric chemistry.

The report discusses research which shows that the quantity of the pollutant emitted or the intensity of the photochemical effect observed with solar irradiation is related to an increase in fuel aromatic content on a per vehicle basis. These estimates do not include the compensation in effects of fuel aromatic increases resulting from the decrease in overall emissions reported to occur from substitution of unleaded deposits from lead-free fuel usage for the present lead deposits. This unleaded deposit effect has been found in most studies to reduce gaseous emissions and polynuclear aromatic hydrocarbon emissions. The cause of this deposit effect has not been isolated with respect to lead, phosphorus and base fuel characteristics.

PB-256 957/2GA PC$4.00/MF$3.00
CH2M-Hill, Reston, Va.
Physical - Chemical Treatment Plant Design,
Gordon L. Culp. Aug 72, 34p

Prepared for Environmental Protection Agency, Washington, D.C.

Descriptors: *Sewage treatment, Design criteria, Process charting, Chemical removal(Sewage treatment), Phosphorus, Coagulants, Adsorbents, Flocculation, Carbon.
Identifiers: Physical chemical sewage treatment.

The various approaches to physical-chemical treatment all involve the use of coagulation and settling for removal of suspended solids and, in some cases, phosphorus. Also, all involve the use of activated carbon for the removal of soluble organics. Some also involve the use of filtration for further removals of suspended solids and phosphorus. The purpose of this paper is to discuss typical design parameters for the unit processes involved in physical-chemical treatment of raw wastes and how the design engineer may determine the design criteria best suited for a given wastewater.

PB-256 960/6GA PC$3.50/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Office of Solid Waste Management Programs.
Paper and Plastic Solid Waste Sacks. A Summary of Available Information.
Open-file rept.,
Betty L. Grupenhoff, and Kenneth A. Shuster.
1971, 20p TO-18.1.037/1

Descriptors: *Solid waste disposal, *Bags, *Paper, *Plastics, Packaging materials, Storage, Collection, Performance evaluation, Management planning, Refuse disposal.

Sacks for storing solid waste were initially tried in Europe but recently--within about the last 12 years--their use has spread to the United States. Much research has been done on solid waste sacks, both paper and plastic. Many communities have tried paper sacks, plastic sacks, or both in test areas to determine their acceptability as solid waste storage containers and to identify their effect on solid waste collection and disposal. The purpose of this paper is to summarize what research has been done and the reported findings of the many test and community-wide programs on this subject.

PB-256 971/3GA PC$2.20/MF$3.00
Transportation Research Board, Washington, D.C.
Transportation for Elderly, Disadvantaged, and Handicapped People in Rural Areas,
Alice E. Kidder. 1976, 54p* TRB/TRR-578

Descriptors: *Transportation, *Elderly persons, *Handicapped persons, *Rural areas, Economic factors, Cost estimates, Mobility, Travel patterns, Wheelchairs, Transportation management, Pennsylvania, New York.
Identifiers: Rural transportation, Public transportation, Buffalo(New York).

The five papers include (a) a review of the economics of rural public transportation programs; (b) a report on work done by the Governor's Rural Transportation Task Force in Pennsylvania on estimating demand for the cost of transportation in all rural areas of Pennsylvania; (c) a report of a survey carried out in Buffalo, New York, to examine the differences in travel behavior between those who had access to and use of a car and those who did not; (d) a presentation of findings and specification recommendations for loading and securing wheelchairs in transporting students; and (e) an analysis of transportation mobility of the handicapped.

PB-256 972/1GA PC$3.80/MF$3.00
Transportation Research Board, Washington, D.C.
Innovations in Transportation System Planning,
Walter G. Hansen. 1976, 94p* TRB/TRR-582, ISBN-0-309-02496-X

Descriptors: *Urban transportation, *Urban planning, *Regional planning, Transportation models, Metropolitan areas, Community development, Parks, Roads, Railroads.
Identifiers: Transportation planning, Regional transportation.

The seven papers focus on various aspects of transportation planning ranging from state and regional planning to metropolitan and subcommunity planning. They include (a) review of the metropolitan transportation planning process of the 1960s; (b) discussion of the community aggregate planning model; (c) discussion of circulation simulation model to be used in a heuristic method of evaluating and selecting from alternative transit designs; (d) presentation of a conceptual approach to formulate a more comprehensive program for studying and improving trails for park and recreational areas; (e) discussion of the purposes and objectives of the Regional Rail Reorganization Act of 1973; (f) a report on the progress being made in developing a regional simulation model that is interactive and linked with employment, population, land use, and transportation components; and (g) discussion of experience in Wisconsin as it relates to state-regional transportation planning.

PB-256 975/4GA PC$6.00/MF$3.00
Transportation Research Board, Washington, D.C.
New Approaches to Travel Forecasting.
Transportation research record,
Carmen Difiglio, and Marshall F. Reed, Jr. 1976, 161p* TRB/TRR-569, ISBN-0-309-02482-X

Descriptors: *Urban transportation, *Travel demand, *Forecasting, *Transportation models, Transportation management, Management planning, Research, Travel patterns.
Identifiers: Travel forecasting models, Modal split models, Travel demand models, *Travel forecasting, Travel patterns, Travel planning, Commuting patterns, Automobile ownership, Work travel patterns.

Contents:
- Transit sketch planning procedures;
- Approaches to travel behavior research;
- Disaggregate behavioral model of automobile ownership;
- Theory of urban-household automobile-ownership decisions;
- Time-stability analysis of trip-generation and predistribution modal-choice models;
- A synthesized trip-forecasting model for small- and medium-sized urban areas;
- Development of a simulation model for regional recreational travel;
- Disaggregate multimodal model for work trips in the Netherlands;
- Structural travel demand models--an intercity application;
- Joint-choice model for frequency, destination, and travel mode for shopping trips.

PB-257 017/4GA PC$13.50/MF$3.00
TRW Transportation and Environmental Operations, Redondo Beach, Calif.
An Implementation Plan for Suspended Particulate Matter in the Los Angeles Region. Technical Support Documents. 1. Analysis of Air Monitoring Data. 2. Emission Inventories and Projections. 3. Air Quality - Emission Level Relationship. 4. Alternative Emission Control Measures,
K. W. Crawford, and J. C. Trijonis. Mar 76, 570p
Sponsored in part by Environmental Protection Agency, San Francisco, Calif. Region IX. See also report dated Mar 75, PB-251 292.

Descriptors: *Air pollution abatement, *Metropolitan areas, California, Particles, Urban planning, Regional planning, Methodology, Standards, Recommendations, Control, Reduction, Performance evaluation, Monitoring, Inventories.
Identifiers: *Los Angeles(California), Total suspended particulates, Air quality control regions, National ambient air quality standards, Air pollution standards, Implementation air pollution planning program, Alternatives.

This report presents the results of a study to develop a particulate implementation plan for the Metropolitan Los Angeles Air Quality Control Region. The Los Angeles Region presently experiences suspended particulate levels well in excess of the National Ambient Air Quality Standards. This study formulates control strategies which produce substantial reductions in suspended particulate levels and evaluates the impact of these strategies in 1977 and 1980. Because of the severity of the Los Angeles particulate problem and because of significant background particulate levels, the strategy for standard attainment is of a very drastic nature. This study formulates and recommends other less drastic control plans for actual implementation.

PB-257 034/9GA PC$4.00/MF$3.00
Kentucky Univ., Lexington. Inst. for Mining and Minerals Research.
The Future of Surfaced-Mined Lands.
Jul 76, 35p IMMR20-M2-76
Proceedings of a Round Table Seminar Held at Slade, Kentucky on April 14-16, 1976.

Descriptors: *Land reclamation, *Surface mining, *Meetings, *Land use, Management planning, Ecology, Productivity, Utilization, Industrial relations, Spoil, Agriculture, Ornamental trees, Recreational facilities, Economic development.
Identifiers: Industrial parks.

Included is a collection of selected papers presented during a two-day seminar. Three major aspects concerning the future of surface-mined lands were emphasized: Preplanning as the key element regarding secondary land uses after the mining operations are completed; Futuristic ecology involving the potential productivity of the land and how it relates to the future of man; After-the-fact land uses or uses that can be established with minimal changes in the topography after reclamation.

PB-257 038/0GA PC$4.00/MF$3.00
National Air Pollution Control Administration, Washington, D.C. Div. of Abatement.
Air Pollution Report, Federal Facilities. Metropolitan Chicago Interstate Air Quality Control Region,
Robert S. Russo. Mar 70, 37p
See also PB-211 801.

Descriptors: *Air pollution abatement, *Regional planning, *Metropolitan areas, Illinois, Indiana, Counties, Fuels, Combustion products, Refuse disposal, Sulfur oxides, Nitrogen oxides, Carbon monoxide, Particles, Hydrocarbons, Rates(Per time).
Identifiers: *Air pollution standards, Violations, *Chicago(Illinois), Air quality control regions, Clean Air Act.

The Metropolitan Chicago Interstate Air Quality Control Region was designated on November 20, 1968. It encompasses six counties in Illinois: Cook, Du Page, Kane, Lake, McHenry and Will; and two counties in Indiana; Lake and Porter. A map of the region is shown. This report presents the status of the Federal facilities in the Region regarding implementation of the objectives prescribed by the Clean Air Act and Executive Order 11507. A quantitative evaluation of emissions, data on fuel burning and refuse

disposal, and abatement plans are included. The data in this report reflect that most recently available.

PB-257 039/8GA PC$4.00/MF$3.00
National Air Pollution Control Administration, Washington, D.C. Div. of Abatement.
Air Pollution Report, Federal Facilities. National Capital Interstate Air Quality Control Region,
Carl E. Edlund. Mar 70, 48p
See also PB-229 993. Errata sheet inserted.

Descriptors: *Air pollution, *Metropolitan areas, *Environmental surveys, *District of Columbia, Maryland, Virginia, Sources, National government, Fuel consumption, Refuse disposal, Air pollution abatement, Facilities, Statistical data.
Identifiers: Air quality control regions, Violations, Federal air pollution sources.

The report describes the boundaries, counties and municipalities of the Washington D.C. National Capitol Interstate Air Quality Control Region, gives the type and number of Federal facilities that contribute to air pollution, discusses the federal contribution to pollution, and reviews the remedial measures which are either proposed or accomplished.

PB-257 063/8GA PC$5.00/MF$3.00
Utah Water Research Lab., Logan.
Nitrogen Cycling in Microcosms and Application to the Biology of the Northern Arm of the Great Salt Lake,
John C. Stube, Frederick J. Post, and Donald B. Porcella. Jun 76, 94p PRJSBA-016-1, W76-11778, , OWRT-A-024-UTAH(2)
Contract DI-14-34-0001-6046

Descriptors: *Water pollution abatement, *Nitrogen cycle, *Great Salt Lake, Algae, Salinity, Biomass, Bacteria, Shrimps, Diptera, Sediments, Sampling, Interactions, Nitrification, Waste water, Sources, Utah.
Identifiers: *Microcosms, Halobacteriae, Dunaliella saliva, Dunaliella viridis, Artemia salina, Ephydra gracilis, Ephydra hians.

Nitrogen cycling was studied in the hypersaline north arm of the Great Salt Lake. The lake, particularly the north arm, has a massive accumulation of organic matter from at least 10 cycles in the last 100,000 years from a freshwater to a saline lake, plus the influence of human industry and agriculture in more recent times. The north arm planktonic and attached community consists of principally, in order of biomass: bacteria of at least two genera, Halobacterium and Halococcus; two algae, Dunaliella salina and D. viridis; the brine shrimp, Artemia salina; and, two species of brine fly, Ephydra gracilis and E. hians and possibly one more species. The nitrogen cycle was studied using weekly lake samples and sediment-water microcosms.

PB-257 075/2GA PC$7.50/MF$3.00
Idaho State Dept. of Health and Welfare, Boise. Div. of the Environment.
Weiser-Lower Payette Water Quality Surveys: Lower Payette River (Mouth to Black Canyon Dam RM 38.4), Weiser River (Mouth to Tamarack RM 100) August 1975 and December 1975.
Working paper,
D. R. Tangarone, and B. Bogue. 1976, 189p
EPA/910/8-76/098

Descriptors: *Water pollution, *Weiser River, *Payette River, Surveys, Inorganic phosphates, Inorganic nitrates, Bioassay, Primary biological productivity, Chemical properties, Mathematical models, Snake River Basin, Water quality, Drainage, Nutrients, Sources, Tables(Data), Irrigation, Idaho.
Identifiers: *Water quality data, Non point sources.

In 1975, cooperative Idaho Department of Health and Welfare/Environmental Protection Agency intensive water quality surveys were conducted on the Weiser and Payette Rivers located in the Middle Snake River Basin in Idaho. These surveys were done during the summer irrigation season and higher flow non-irrigation winter period to determine the effect of irrigation activities and point source discharges upon water quality. The surveys consisted of monitoring stream water quality, sources relating to municipal, industrial and agricultural activities, and biological populations at pre-determined locations within each river system.

PB-257 081/0GA PC$13.75/MF$3.00
Geological Survey, Austin, Tex. Water Resources Div.
Water Resources Data for Texas, Water Year 1975. Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin and Intervening Coastal Basins.
Water-data rept. 1 Oct 74-30 Sep 75.
Jun 76, 579p USGS/WRD/HD-76/025, USGS/WDR/TX-75/1
Prepared in cooperation with Texas Water Development Board, Austin, Texas State Dept. of Highways and Public Transportation, Austin, Corps of Engineers, Washington, D.C., and Soil Conservation Service, Washington, D.C. See also Volume 2, PB-257 082.

Descriptors: *Hydrology, *Ground water, *Surface waters, *Water pollution, *Texas, Tables(Data), Stream flow, Flow rate, Lakes, Reservoirs, Observation wells, Temperature, Water analysis, Inorganic phosphates, Inorganic nitrates, Sulfates, Chlorides, Fluorides, Bacteria, Metals, Conductivity, Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin.
Identifiers: Water levels, *Water quality data, Peak discharge.

Surface-water data for the 1975 water year for Texas are presented in three volumes, appropriately identified as to content by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs. Also included are crest-stage and flood-hydrograph partial-record stations, reconnaissance partial-record stations, and low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. Records for a few pertinent stations in bordering States are also included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating state and federal agencies in Texas.

PB-257 082/8GA PC$11.75/MF$3.00
Geological Survey, Austin, Tex. Water Resources Div.
Water Resources Data for Texas, Water Year 1975. Volume 2. San Jacinto River Basin, Brazos River Basin, San Bernard River Basin and Intervening Coastal Basins.
Water-data rept. 1 Oct 74-30 Sep 75.
Jun 76, 447p USGS/WRD/HD-76/026, USGS/WDR/TX-75/2
Prepared in cooperation with Texas Water Development Board, Austin, Texas State Dept. of Highways and Public Transportation, Austin, Corps of Engineers, Washington, D.C., and Soil Conservation Service, Washington, D.C. See also Volume 1, PB-257 081 and Volume 3, PB-257 083.

Descriptors: *Hydrology, *Ground water, *Surface waters, *Water pollution, *Texas, Tables(Data), Stream flow, Flow rate, Lakes, Reservoirs, Observation wells, Temperature, Water analysis, Inorganic phosphates, Inorganic nitrates, Sulfates, Chlorides, Fluorides, Bacteria, Metals, Conductivity, San Jacinto River Basin, Brazos River Basin, San Bernard River Basin.
Identifiers: Water levels, *Water quality data, Peak discharge.

Surface-water data for the 1975 water year for Texas are presented in three volumes, appropriately identified as to content by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs. Also included are crest-stage and flood-hydrograph partial-record stations, reconnaissance partial-record stations, and low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. Records for a few pertinent stations in bordering States are also included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating state and Federal agencies in Texas.

PB-257 083/6GA PC$12.75/MF$3.00
Geological Survey, Austin, Tex. Water Resources Div.
Water Resources Data for Texas, Water Year, 1975. Volume 3. Colorado River Basin, Lavaca River Basin, Guadalupe River Basin, Nueces River Basin, Rio Grande Basin and Intervening Coastal Basins.
Water-data rept. 1 Oct 74-30 Sep 75.
Jun 76, 523p USGS/WRD/HD-76/025-Vol-3, USGS/WDR/TX-75/3
Prepared in cooperation with Texas Water Development Board, Austin, Texas State Dept. of Highways and Public Transportation, Austin, Corps of Engineers, Washington, D.C., and Soil Conservation Service, Washington, D.C. See also Volume 2, PB-257 082.

Descriptors: *Hydrology, *Ground water, *Surface waters, *Water pollution, *Texas, Tables(Data), Stream flow, Flow rate, Lakes, Reservoirs, Observation wells, Temperature, Water analysis, Inorganic phosphates, Inorganic nitrates, Sulfates, Chlorides, Fluorides, Bacteria, Metals, Conductivity, Colorado River Basin, Lavaca River Basin, Guadalupe River Basin, Nueces River Basin, Rio Grande Basin.
Identifiers: Water levels, *Water quality data, Peak discharge.

Surface-water data for the 1975 water year for Texas are presented in three volumes, appropriately identified as to content by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs. Also included are crest-stage and flood-hydrograph partial-record stations, reconnaissance partial-record stations, and low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. Records for a few pertinent stations in bordering States are also included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating state and Federal agencies in Texas.

PB-257 089/3GA PC$9.25/MF$3.00
Hydrocomp Inc., Palo Alto, Calif.
Modeling Nonpoint Pollution from the Land Surface.
Final rept.,
Anthony S. Donigian, Jr., and Norman H. Crawford. Jul 76, 294p* EPA/600/3-76/083
Grant EPA-R-803315-01-0

Descriptors: *Stream pollution, *Stream flow, *Land development, *Mathematical models, Watersheds, Sites, Runoff, Sources, Water quality, Urban areas, Computerized simulation, Land use, Sedimentation, Channel improvements, Sediment transport, Rural areas, North Carolina, Wisconsin, Washington(State), Computer programs, FORTRAN.
Identifiers: NPS model, Organic loadings, Durham(North Carolina), Madison(Wisconsin), Seattle(Washington), Nonpoint Source Pollution Loading Model, Nonpoint sources.

Development and initial testing of a mathematical model to continuously simulate pollutant contributions to stream channels from nonpoint sources is presented. The Nonpoint Source Pollutant Loading (NPS) Model is comprised of subprograms to represent the hydrologic response of a watershed, including snow accumulation and melt, and the processes of pollutant accumulation, generation, and washoff from the land surface. The simulation of nonpoint pollutants from both pervious and impervious areas is based on sediment as a pollutant indicator. The calculated sediment washoff is multiplied by user-specified 'potency factors' that indicate the pollutant strength of the sediment for each pollutant simulated. Both urban and rural areas can be simulated. Initial testing of the NPS Model was performed on three urban watersheds in Durham, North Carolina; Madison, Wisconsin; and Seattle, Washington.

PB-257 090/1GA PC$10.50/MF$3.00
FluiDyne Engineering Corp., Minneapolis, Minn.
Particulate Sampling Strategies for Large Power Plants Including Nonuniform Flow.
Final rept. Jun 73-Dec 75,
H. A. Hanson, R. J. Davini, J. K. Morgan, and A. A. Iversen. Jun 76, 371p EPA/600/2-76/170
Contract EPA-68-02-1244

Descriptors: *Particles, *Electric power plants, *Ducts, Aerosols, Field tests, Sampling, Chimneys, Concentration(Composition), Industrial wastes, Combustion products, Air pollution control devices, Sites, Design criteria, Mathematical models, Monitoring, Data(Tables), Velocity measurement, Aerodynamics.
Identifiers: *Air pollution sampling, In plant processes.

This report describes the results of a study to determine the effects that various geometric ducting configurations have on the flow profiles and the distribution of particulate in ducting systems of large (> 100 MW) power plants. The program included both laboratory model studies and field testing at large power plants. The measurement of total volumetric flow and particulate emissions at less than full operating capacity was also investigated. The results of flow angularity measurements in large stacks at typical sample port locations, including downstream of induced draft fans, are similarly discussed. Special attention was given to the aerodynamic effects of S-tube/sampling probe interference on velocity measurements with an S-tube in EPA Stack Emissions Measurement Reference Methods 2 and 5. A computerized technique was used to determine the effectiveness of various equal area sampling strategies in providing accurate measurements of three emission parameters: average particulate concentration, total volumetric flow rate, and total emissions. Numerous typical and atypical velocity and particulate concentration profiles were studied. Sampling strategy recommendations are presented.

PB-257 093/5GA PC$5.00/MF$3.00
North Carolina Water Resources Research Inst., Raleigh.
Evaluation of Soil Systems for Land Disposal of Industrial and Municipal Effluents,
B. L. Carlile, and J. A. Phillips. Jul 76, 77p UNC-WRRI-76-118, W76-11774, , OWRT-A-071-NC(2)
Contract DI-14-31-0001-5033

Descriptors: *Sewage treatment, *Irrigation, *Industrial waste treatment, *Land use, *Soils, Soil properties, Drainage, Hydraulic conductivity, Salinity, Oxygen, Design, Waste water, pH, Ion exchanging, Nutrients, North Carolina.
Identifiers: *Sewage irrigation, Organic loadings, Land disposal.

The suitability of soils of North Carolina for application of industrial and municipal wastes was studied. In the Coastal Plain soil resource area, soil drainage is the most critical physical parameter in determining suitability of field sites for waste applications. Of the seven field sites investigated, five were located in the Coastal Plain soil resource area and two in the Piedmont soil resource area. Design loadings which can be utilized at these sites varied considerably, including hydraulic loadings of one inch per week on the Piedmont sites and up to four inches per week on the rapidly drained sands of the Coastal Plain. Organic loadings which could be successfully utilized on each site ranged from about 1100 lb/a/wk to about 4000 lb/a/wk of total oxygen demanding material, again with the lower rates required on the Piedmont soils. Of the sites investigated, salt problems were responsible for more operational problems than any other design parameter.

PB-257 094/3GA PC$4.50/MF$3.00
New England River Basins Commission, Boston, Mass.
An Economic Analysis of Coastal Resource Allocation in Southeastern New England.
Final rept.,
Gregory A. Vaut. Jun 74, 73p NERBC-61

Descriptors: *Coastal zone management, *Natural resources, *Systems management, Urbanization, Community development, Recreation, Fishing, Water transportation, Agreements, Waste disposal, Government policies, Control, Regulations, Policies, Massachusetts, Rhode Island.
Identifiers: New England.

The report assesses the competition among four uses of the Massachusetts-Rhode Island coastline: urbanization and development; recreation; commercial fishing; water transportation. The greatest competition on coastal resources is between residential development and recreation. While commercial fishing is compatible with other uses of the coastal zone, it can be threatened by their waste products. Water transportation is not expected to grow in the SENE region, although the composition of harbors is expected to change because of changes within the industry. The conclusion is that comprehensive coastal zone management on a regional scale is needed to control coastal resource allocation. Four management policy alternatives are evaluated: agreements, public policy inducements, regulatory controls and compulsory taking.

PB-257 133/9GA PC$6.75/MF$3.00
General Electric Co., Santa Barbara, Calif. TEMPO.
Monitoring Groundwater Quality: Methods and Costs.
Final rept.,
Lorne G. Everett, Kenneth D. Schmidt, Richard M. Tinlin, and David K. Todd. May 76, 152p*
GE75TMP-69, EPA/600/4-76/023
Contract EPA-68-01-0759

Descriptors: *Water pollution, *Ground water, *Monitoring, *Cost engineering, Water quality management, Cost analysis, Economic factors, Aquifers, Water wells, Estimating, Surface waters, Soil water, Optimization, Saturation, Subsurface drainage.
Identifiers: Groundwater movement, *Aquifer characteristics, *Water pollution sampling.

The report describes various groundwater monitoring methods and provides a generalized cost breakdown of the major economic factors for each method. All possible groundwater-related measuring techniques applicable at the land surface, topsoil, vadose zone and zone of saturation are presented. Each monitoring method is described, referenced and illustrated. Estimates of itemized capital and operational costs are presented. The material is presented for in-depth reference purposes without recommendation for least-cost techniques, a least-cost mix of groundwater monitoring approaches, or an optimal information system.

PB-257 146/1GA PC$12.50/MF$3.00
Industrial Environmental Research Lab., Research Triangle Park, N.C.
Proceedings of the Stationary Source Combustion Symposium. Volume III. Field Testing and Surveys.
Environmental protection technology series.
Jun 76, 476p EPA/600/2-76/152c
See also Volume 2, PB-256 321.

Descriptors: *Air pollution, *Electric power plants, *Gas turbines, *Combustion, *Meetings, Boilers, Field tests, Coal, Fuel oil, Natural gas, Nitrogen oxides, Sulfur dioxide, Process heat, Smoke, Particles, Carbon monoxide, Hydrocarbons, Utilities, Design, Fossil fuels, Polycyclic compounds, Surveys, Performance evaluation.
Identifiers: Stationary sources, Combustion modification, Western coal, Particulates.

Contents:
- The effect of combustion modification on pollutants and equipment performance of power generation equipment;
- Analysis of gas-, oil-, and coal-fired utility boiler test data;
- Influence of combustion modifications on pollutant emissions from industrial boilers;
- Systems evaluation of the use of low-sulfur western coal in existing small- and intermediate-sized boilers;
- A survey of emissions control and combustion equipment data in industrial process heating;
- POM (Polycyclic Organic Matter) and particulate emissions from small commercial stoker-fired boilers;
- Concluding remarks.

PB-257 153/7GA PC$16.25/MF$3.00
Geological Survey, Portland, Oreg. Water Resources Div.
Water Resources Data for Oregon, Water Year 1975.
Water-data rept. 1 Oct 74-30 Sep 75.
May 76, 607p USGS/WRD/HD-76/017, USGS/WDR-OR-75/1
Prepared in cooperation with Oregon State Water Resources Dept., Oregon State Highway Commission, Salem, Corps of Engineers, Washington, D.C., and Environmental Protection Agency, Washington, D.C.

Descriptors: *Hydrology, *Ground water, *Surface waters, *Water pollution, *Oregon, Tables(Data), Stream flow, Flow rate, Lakes, Reservoirs, Observation wells, Temperature, Water analysis, Inorganic phosphates, Inorganic nitrates, Sulfates, Chlorides, Fluorides, Bacteria, Metals, Conductivity.
Identifiers: Water levels, *Water quality data, Peak discharge.

Water resources data for the 1975 water year for Oregon consist of records of stage, discharge,

and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality in wells and springs. This report contains discharge records for 300 gaging stations; stage only records for 8 gaging stations; stage and contents for 40 lakes and reservoirs; water quality for 83 gaging stations, and water levels for 103 observation wells. Also included are 178 crest-stage partial-record stations and 12 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating state and Federal agencies in Oregon.

PB-257 155/2GA PC$4.50/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Office of Research and Development.
News of Environmental Research in Cincinnati - 1975.
Sep 76, 57p EPA/600/9-76/017
See also report dated Mar 75, PB-240 131.

Descriptors: *Water pollution, *Sewage treatment, Scientific research.
Identifiers: *National Environmental Research Center.

A series of reports is presented on the following subjects: NERC--Cincinnati electron microscope facility; poliovirus and bacterial indicators of fecal pollution in landfill leachates; examination of drinking water supplies for viruses; a copper-cadmium column for manually determining nitrate; pollution from urban land runoff; striving for zero discharge of industrial wastes; sewer transport of household refuse; a replacement for the refuse truck; the bacterial quality of bottled water; modern ways of strip mining in mountainous areas; nature and use of coal ash from utilities; a radiotelemetry system for monitoring respiration in dogs; improving the fuel value of sewage sludge; and do regulated freight rates discourage recycling.

PB-257 158/6GA PC$5.50/MF$3.00
Maryland Univ., College Park. Dept. of Civil Engineering.
Hydraulic Characteristics of Reticular Inlet Grates.
Final rept.,
Robert M. Ragan, Thomas E. Gingrich, and Thomas J. Jackson. Jan 76, 107p FHWA/MD/R-76/11

Descriptors: *Highways, *Surface drainage, *Drop inlets, *Grilles, Hydraulics, Drainage, Bicycles, Safety engineering, Maryland.
Identifiers: *Inlet grates.

The report describes the experimental approach followed in the development of rating curves for Maryland State Highway Administration Standard WR, Standard NR, and Single WR reticular inlet grates. Rating curves for these grates are given for longitudinal slopes between 0 and 13%, and cross slopes between 1.6 and 10% are presented.

PB-257 182/6GA PC$10.75/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
Symposium Proceedings: Environmental Aspects of Fuel Conversion Technology, II (December 1975, Hollywood, Florida).
Final rept.,
Franklin A. Ayer. Jun 76, 389p* EPA/600/2-76/149
Contract EPA-68-02-1325
See also PB-238 304.

Descriptors: *Environmental surveys, *Air pollution, *Coal preparation, *Meetings, *Coal gasification, Fossil fuels, Law enforcement, Trace elements, Geochemistry, Carbon dioxide, Fluidized bed processors, Sulfur, Particles, Sampling, Air pollution control, Industrial wastes, Water pollution control, Combustion products, Climatology, Effluents, Nitrogen oxides, Environmental impacts, Process charting, Assessments.
Identifiers: Synthetic fuels, Winkler process, Bi-gas process, Combined cycles, Synthoil process, Liquid fuels, SRC process, *Coal liquefaction.

The report covers EPA's second symposium on the environmental aspects of fuel conversion technology. The symposium was conducted at the Diplomat Hotel, Hollywood, Florida, December 15-18, 1975. Its main objective was to review and discuss environmentally related information in the field of fuel conversion technology. Specific topics were environmental problem definition, process technology, control technology, and process measurements.

PB-257 201/4GA PC$7.50/MF$3.00
New York State Energy Research and Development Authority, New York.
Multifarious Power Plant Water Intake Structure (MWIS). A Design Concept to Reduce the Environmental Effects of Cooling Water Intake Structures.
Final rept.,
Bart Chezar. Jul 76, 180p NYSERDA-75/06

Descriptors: *Water intakes, *Electric power plants, Cooling water, Intake systems, Design, Environmental engineering, Entrainment, Impingement, Aquatic animals, Zooplankton, Water pollution.
Identifiers: *Multifarious power plant water intake structures.

The design for the Multifarious Power Plant Water Intake Structure (MWIS) was developed to reduce the entrainment and impingement of aquatic organisms in water intakes requiring large volumes of cooling water. Its uniqueness is based upon the operation of the system relating to the concentration, distribution and behavior of aquatic organisms. The principals design features are horizontal traveling screens which move in the direction and speed of the ambient water flow, three alternate levels of water withdrawal and adjustable louvers in front of the intake structure. Each component of the MWIS design is analyzed as to its effectiveness in reducing the environmental effects of operation. Results indicate a significant improvement over existing intake structures.

PB-257 210/5GA PC$10.00/MF$3.00
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, Mass.
Lateral Support Systems and Underpinning. Volume I. Design and Construction.
Final rept.,
Donald T. Goldberg, Walter E. Jaworski, and Daniel Gordon. 1 Apr 76, 327p 1363-Vol-1, FHWA/RD-75-128
Contract DOT-FH-11-8499
Also available in set of 3 reports as PB-257 209-SET, PC$29.50/MF$4.75.

Descriptors: *Tunneling(Excavation), *Bracing, Supports, Underground supporting, Lateral pressure, Earth pressure, Ground water, Construction, Design.
Identifiers: *Lateral supports, *Cut and cover tunneling, *Foundation engineering.

This volume is a convenient reference on the design and construction of lateral support systems and underpinning which are often required in conjunction with cut-and-cover or soft ground tunneling. The design recommendations and construction methods described herein are a summary of the more detailed information presented in the companion volumes of this study. Included in this volume are discussions of displacements, lateral earth pressure, ground water, passive resistance, stability analysis, bearing capacity, soldier piles, steel sheeting, diaphragm walls, bracing, tiebacks, underpinning, grouting, and freezing. An overview compares the relative costs of the construction methods used in lateral support systems and underpinning. Other reports developed from the study are FHWA-RD-75-129, Volume 2, Design Fundamentals; FHWA-RD-75-130, Volume 3, Construction Methods; and FHWA-RD-75-131, Concepts for Improved Lateral Support Systems.

PB-257 211/3GA PC$9.00/MF$3.00
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, Mass.
Lateral Support Systems and Underpinning. Volume II. Design Fundamentals.
Final rept.,
Donald T. Goldberg, Walter E. Jaworski, and Daniel Gordon. 1 Apr 76, 252p 1363-Vol-2, FHWA/RD-75-129
Contract DOT-FH-11-8499
Also available in set of 3 reports as PB-257 209-SET, PC$29.50/MF$4.75.

Descriptors: *Tunneling(Excavation), *Bracing, Supports, Underground supporting, Lateral pressure, Earth pressure, Ground water, Construction, Design.
Identifiers: *Lateral supports, *Cut and cover tunneling, *Foundation engineering.

This report provides current information and design guidelines on cut-and-cover tunneling for practicing engineers. The main emphasis is on the geotechnical aspects of engineering. Included in this volume is a state-of-the-art summary of displacements and lateral pressure. Other topics are basic concepts of soil mechanics, ground water in open cut, passive resistance, design aspects of lateral earth pressure, stability analysis of sheeted excavations, bearing capacity of deep foundations, and construction monitoring. Detailed explanations of design methods and literature citations are included. Other reports prepared as part of the study are FHWA-RD-75-128, Volume I, Design and Construction; FHWA-RD-75-130, Volume 3, Construction Methods; and FHWA-RD-75-131, Concepts for Improved Lateral Support Systems.

PB-257 212/1GA PC$12.50/MF$3.00
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, Mass.
Lateral Support Systems and Underpinning. Volume III. Construction Methods.
Final rept.,
Donald T. Goldberg, Walter E. Jaworski, and Daniel Gordon. 1 Apr 76, 480p 1363-Vol-3, FHWA/RD-75-130
Contract DOT-FH-8499
Also available in set of 3 reports as PB-257 209-SET, PC$29.50/MF$4.75.

Descriptors: *Tunneling(Excavation), *Bracing, Supports, Underground supporting, Lateral pressure, Earth pressure, Ground water, Construction, Design.
Identifiers: *Lateral supports, *Cut and cover tunneling, *Foundation engineering.

This provides specific design recommendations, design considerations, and construction techniques for the construction of lateral support systems and underpinning. The design considerations are presented for each technique or method (soldier piles, steel sheeting, diaphragm walls, internal bracing, tiebacks, underpinning, grouting, and freezing). The factors affecting the design or implementation of these schemes are discussed. Construction techniques are presented, and

literature references are provided for those seeking even greater detail. An overview of the construction methods compares the applicability of the techniques and the construction costs of each. Other reports developed from the study are FHWA-RD-128, Volume I, Design and Construction; FHWA-RD-129, Volume 2, Design Fundamentals; and FHWA-RD-131, Concepts for Improved Lateral Support Systems.

PB-257 213/9GA PC$7.50/MF$3.00
State Univ. of New York at Albany. Dept. of Public Administration.
Politics of Shore Erosion: Westhampton Beach,
Joseph M. Heikoff. 1976, 176p NOAA-76061401

Descriptors: *Beach erosion, *Shores, *Decision making, Political science, Shore protection, Coasts, Barriers, Islands(Landforms), Coastal zone management, Interactions, Geomorphology, Westhampton Beach, State government, Local government, Books, Long Island, New York.
Identifiers: Sea Grant program, Intergovernmental relationships.

The volume analyzes the problem of intergovernmental and political decision-making through the detailed example of a specific environmental problem. The problem and its causes, the economic and political factors are examined. Heikoff's thorough study (1) introduces the reader to the problems of resources management in the coastal zone; (2) explains barrier islands, their formation and how they affect coastal geomorphologic processes; (3) tells U.S. Army Corps of Engineers solution to shore erosion; (4) analyzes federal, state and local structures for interaction and decision-making in managing coastal resources; and, (5) describes the role of the individual citizen and of groups influencing public decisions.

PB-257 247/7GA PC$6.75/MF$3.00
North Carolina State Univ., Raleigh.
Ecological Determinants of Coastal Area Management. Volume I. An Overview,
Francis Parker, David Brower, and Dirk Frankenberg. Apr 76, 163p* UNC-SG-76-05-Vol-1, NOAA-76052601
Grant NOAA-04-6-158-44054
See also PB-257 248.

Descriptors: *Ecology, *Water resources, *Coastal zone management, *North Carolina, Coastal topographic features, Policies, Soil erosion, Estuaries, Sedimentation, Barriers, Project planning, Marshes, Dunes, Beaches, Forest land, Aquifers, Land acquisition, Environmental impacts, Management.
Identifiers: Sea Grant program.

The report is a synthesis of natural science information relating to the North Carolina coastal area, followed by policy and management implications of that information. The material was prepared jointly by the Marine Sciences Program and the Center for Urban and Regional Studies; both are parts of the University of North Carolina. The report draws on two lengthy appendices: 'Ecological Determinants,' prepared by the Marine Sciences Program, and 'Tools and Techniques for Coastal Area Management' prepared by the Center for Urban and Regional Studies. These appendices are bound separately as Volume II of this report but the table of contents is included in this volume for reference.

PB-257 248/5GA PC$10.75/MF$3.00
North Carolina State Univ., Raleigh.
Ecological Determinants of Coastal Area Management. Volume II. Appendices.
Sea Grant pub.,
Raymond Alden, David Brower, B. J. Copeland, Dirk Frankenberg, and Francis Parker. Apr 76, 400p* UNC-SG-76-05-Vol-2, NOAA-76070105
Grant NOAA-04-6-158-44054
Sponsored in part by North Carolina State Dept. of Administration, Raleigh. See also PB-257 247.

Descriptors: *Ecology, *Water resources, *Coastal zone management, *North Carolina, Islands(Landforms), Barriers, Estuaries, Lagoons(Ponds), Land acquisition, Taxes, Marshes, Land development, Regulations, Environmental impacts, Public land.
Identifiers: Sea Grant program, Wetlands, Salt marshes.

The report is volume two of a report put out by the North Carolina Sea Grant Program. Included are two appendices. Appendix one discusses the coastal ecological systems--barrier islands, lagoon-estuary systems. Appendix two discusses the tools and techniques for coastal area management--land acquisition, public spending, taxation, development regulation, environmental regulations, regulation of development in areas of environmental concern.

PB-257 257/6GA PC$4.50/MF$3.00
East Carolina Univ., Greenville, N.C.
Estuarine Shoreline Erosion in the Albemarle-Pamlico Region of North Carolina.
Sea Grant pub.,
Vincent Bellis, Michael P. O'Connor, and Stanley R. Riggs. Dec 75, 75p UNC-SG-75-29, NOAA-76060302
Grant NOAA-04-3-158-40

Descriptors: *Shores, *Beach erosion, *Estuaries, Bank protection(Waterways), Shore protection, Coastal topographic features, Sea walls, Clays, Swamps, Forest trees, Riprap, Sea states, Groins(Structures), Sands, Revetments, Sea grasses, Vegetation, Pamlico Sound, North Carolina, Albemarle Sound.
Identifiers: Sea Grant program.

Shoreline erosion within the estuaries of North Carolina is a continuing process which has been in operation for several thousand years. Actual rates of erosion range up to twenty feet per year but average 2-3 feet per year. Variables affecting rate of shoreline erosion are: bank height and composition, vegetative cover, exposure to prevailing winds and fetch, offshore topography, and various human activities. Three major shoreline types are identified on the basis of these parameters. These are: (1) Sand and clay banks; (2) swamp forest; and (3) grass marsh. Of these shoreline types only the sand and clay banks can be easily developed. All types, however, can be protected by shoreline modification structures, use of natural protective features, or appropriate setback regulation.

PB-257 284/0GA PC$6.75/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Water Program Operations.
Federal Guidelines: Pretreatment of Pollutants Introduced Into Publicly Owned Treatment Works.
Oct 73, 160p

Descriptors: *Regulations, *Sewage treatment, *Municipalities, *Government policies, Industrial waste treatment, Policies, Standards, Local government, State government, National government, Requirements.
Identifiers: Federal Water Pollution Control Act Amendments of 1972, Biological industrial waste treatment.

These guidelines are established to assist municipalities, States, and Federal agencies in developing requirements for the pretreatment of wastewaters which are discharged to publicly owned treatment works. The Guidelines also explain the relationship between pretreatment and the effluent limitations for a publicly owned treatment works. The U.S. Environmental Protection Agency (EPA) has published Pretreatment Standards in 40 CFR 128 (Appendix A). The standards will be enforceable by the EPA. These guidelines provide technical information useful to States and municipalities in establishing pretreatment requirements to supplement the Federal pretreatment standards. Authority for these guidelines is contained in Section 304(f) (1) of the Federal Water Pollution Control Act Amendments of 1972.

PB-257 295/6GA PC$4.00/MF$3.00
Comptroller General of the United States, Washington, D.C.
Demonstration Grant Program has Limited Impact on National Solid Waste Disposal Problem. (Report to the Congress).
4 Feb 72, 47p B-166506-720204
Prepared in cooperation with Environmental Protection Agency, Washington, D.C.

Descriptors: *Product management, *Solid waste disposal, Performance evaluation, Technology assessment, National government, Sanitary landfills, Incinerators, Law enforcement, Air pollution control equipment, Grants, Methodology, Efficiency, Projects, Recommendations.
Identifiers: Fault diagnosis.

More than 3.5 billion tons of solid wastes--such as abandoned cars, discarded bottles and cans, and paper--accumulate in the United States each year. About $4.5 billion is spent annually to dispose of wastes from these sources. The most common methods of solid waste disposal are landfill and incineration. A survey has shown that 94 percent of landfills used were inadequate because the wastes were not covered daily or were burned in the open, and that 75 percent of the incinerators used were inadequate because they did not reduce waste efficiently or because they caused air pollution. In view of these facts and of the increasing public and congressional concern over solid waste disposal, GAO reviewed the effectiveness of the Federal grant program conducted by the Office of Solid Waste Management Programs for demonstrating new and improved means of solid waste disposal.

PB-257 299/8GA PC$4.50/MF$3.00
National Field Investigations Center-Denver, Colo.
Compliance Monitoring Procedures.
Jul 74, 51p EPA/330/1-74/002

Descriptors: *Water pollution abatement, *Environmental surveys, *Manuals, Monitoring, Methodology, Standards, Objectives, Limits, Effectiveness, Sampling.
Identifiers: Water pollution standards, Standards compliance, Field surveys, Violations.

A set of guidelines, procedures, and checklists is given to aid in monitoring compliance with water pollution abatement requirements. The report discusses facility inspections and sampling as these relate to monitoring objectives, with some attention to equipment and testing procedures.

PB-257 300/4GA PC$6.00/MF$3.00
National Field Investigations Center-Denver, Colo.
Effluent Limitations Guidelines for Existing Sources and Standards of Performance for New Sources.
Final summary rept.
Aug 74, 130p EPA/330/9-74/001

Descriptors: *Water pollution abatement, *Regulations, *Industrial wastes, Sources, Effluents, Contaminants, Limits, Dairies, Grains(Food), Canning, Sugars, Guidelines, Textile industry, Cements, Electroplating, Chemical industry, Plastics industry, Cleaning agents, Fertilizers, Meat, Paper products, Wood products, Refineries, Metal industry, Electric power generation, Leather, Glass industry, Asbestos, Rubber industry.
Identifiers: *Point sources, Feedlots, Phosphates.

An index of limitations for industrial wastes is presented, by industries and by time units, for existing and expected point sources. The effluent guidelines are to be achieved (1) by July 1977 and (2) by July 1983.

PB-257 306/1GA PC$4.00/MF$3.00
Bureau of Solid Waste Management, Cincinnati, Ohio.
Development of a Method for the Determination of Carbon and Hydrogen in Solid Waste.
Open-file rept.,
Donald L. Wilson. 1970, 38p

Descriptors: *Organic wastes, *Quantitative analysis, Solids, Carbon, Hydrogen, Technology, Solid waste disposal, Combustion, Purification, Gravimetric analysis, Drying apparatus, Homogeneity, Methodology.

Characterization of solid wastes materials is necessary in the planning, designing, operation, and evaluation of refuse processing and disposal systems and facilities. A literature survey of existing methods revealed that a generally new macroanalytical technique would have to be developed for the determination of carbon in solid wastes materials. An investigation into the basic types of carbon methods revealed that the dry combustion-purification-gravimetric approach, which also yields the hydrogen content of samples, is the most promising. This report is an account of the development of such a carbon-hydrogen method.

PB-257 312/9GA PC$9.00/MF$3.00
National Water Well Association, Columbus, Ohio.
Proceedings of the National Ground Water Quality Symposium (2nd), Held at Denver, Colorado, on September 25-27, 1974.
1974, 254p
Contract EPA-68-03-0367

Descriptors: *Water pollution, *Ground water, *Meetings, Water quality management, Political science, Hydrogeology, Water quality management, Septic tanks, Sewage disposal, Aquifers, Sanitary engineering, Earth fills, Mathematical models, Soil water, Hydrocarbons, Subsurface drainage, Bacteria, Strip mining, Hazards.
Identifiers: *Path of pollutants, Water pollution effects(Animals), Priorities, *Groundwater movement.

Contents:
- Ground water and politics;
- C. L. McGuinness-Hydrogeologist, writer, teacher;
- New priorities for ground-water quality protection;
- Rational basis for septic tank system design;
- Effects of septic tank effluent on ground-water quality, Dade County, Florida;
- Subsurface sewage disposal and contamination of ground water in East Portland, Oregon;
- Sampling of variable, waste-migration patterns in ground water;
- Will current research answer today's problems at the sanitary landfill;
- Leachate plumes in a highly permeable aquifer;
- Transpiration drying of sanitary landfills;
- Ground-water quality modeling;
- Uniform distribution in soil absorption fields;
- Waste surveillance in subsurface disposal projects;
- Hydrocarbon dispersion in ground-water significance and characteristics;
- Pickling liquors, strip mines, and ground-water pollution;
- Effluent for irrigation-a need for caution;
- Chemical interaction during deep well recharge, Bay Park, New York;
- Development of fresh ground-water near salt water in West Virginia;
- Subsurface biological activity in relation to ground-water pollution;
- Bacteriological criteria for ground-water quality;
- Natural soil nitrate-The cause of the nitrate contamination of ground water in Runnels County, Texas.

PB-257 319/4GA PC$4.50/MF$3.00
Comptroller General of the United States, Washington, D.C.
Cleaner Engines for Cleaner Air: Progress and Problems in Reducing Air Pollution from Automobiles. (Report to the Congress).
15 May 72, 70p B-166506-720515
Prepared in cooperation with Environmental Protection Agency, Washington, D.C. Office of Air Programs.

Descriptors: *Air pollution abatement, *Exhaust emissions, *Project management, Automobile engines, Improvement, Technology assessment, Projects, Control, Organizations, Effectiveness, Surveys, National government.
Identifiers: *Automobile exhaust, Environmental Protection Agency.

Polluted air menaces U.S. cities, threatens the health of millions, and causes an estimated $16 billion in damage to materials and crops each year. The largest single polluter is the automobile, emitting over 90 million tons of pollutants--about 33 percent of the total--into the air in a recent year. Because of the extent to which the automobile intensifies this pollution problem, the General Accounting Office (GAO) reviewed the progress of the Environmental Protection Agency (EPA) in combating auto-caused air pollution and the problems encountered.

PB-257 326/9GA PC$5.00/MF$3.00
Federal Water Pollution Control Administration, Boulder, Colo. Colorado River-Bonneville Basins Office.
Salinity Control Project Proposal for Dotsero and Glenwood Springs, Eagle and Garfield Counties, Colorado,
R. Sotiros. Feb 70, 96p

Descriptors: *Water pollution, *Salinity, *Water quality management, *Colorado River, Economic impact, Hydrogeology, Water pollution control, Maps, Tables(Data), Dotsero Springs, Glenwood Springs, Yampa Springs.
Identifiers: *Water quality data, Eagle County(Colorado), Garfield County(Colorado).

The report discusses the stratigraphy, flow discharge, water quality, and project proposal.

PB-257 336/8GA PC$7.75/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Public Session in the Matter of Pollution of Lake Michigan and Its Tributary Basin, in the States of Wisconsin, Illinois, Indiana, and Michigan, Held at Chicago, Illinois November 9, 1972.
1972, 209p
See also Volume 2, PB-257 337.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Public opinion, Recommendations, Pesticides, Law enforcement, Metals, Biphenyls, Phosphorus, Odors, Chlorides, Phthalates, Wisconsin, Illinois, Indiana, Michigan.
Identifiers: *Water quality data, Tributaries.

The report describes the public session on the control of pollution in the Lake Michigan Basin. Problems arising from phosphorus, chlorides, heavy metals, pesticides, phthalates, polychlorinated biphenyls, taste and odor, and thermal discharges are considered. Reviews and recommendations are given.

PB-257 337/6GA PC$9.25/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Conference (4th Session), in the Matter of Pollution of Lake Michigan and Its Tributary Basin in the States of Wisconsin, Illinois, Indiana, and Michigan, Held at Chicago, Illinois on September 19-21, 1972. Volume II.
1972, 286p
See also Volume 1, PB-255 145.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Recommendations, Phosphorus, Sediments, Removal, Public opinion, Wisconsin, Illinois, Indiana, Michigan.
Identifiers: Tributaries, *Water quality data, Thermal pollution.

No abstract available.

PB-257 338/4GA PC$10.75/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Conference (4th Session), in the Matter of Pollution of Lake Michigan and Its Tributary Basin in the States of Wisconsin, Illinois, Indiana, and Michigan, Held at Chicago, Illinois on September 19-21, 1972. Volume III.
1972, 394p
See also Volume 4, PB-257 339.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Recommendations, Law enforcement, Water quality, Maps, Public opinion, Wisconsin, Illinois, Indiana, Michigan.
Identifiers: Tributaries, *Water quality data, Thermal pollution.

No abstract available.

PB-257 339/2GA PC$10.75/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Conference (4th Session) in the Matter of Pollution of Lake Michigan and Its Tributary Basin, in the States of Wisconsin, Illinois, Indiana, and Michigan, Held at Chicago, Illinois on September 19-21, 1972. Volume IV.
1972, 381p
See also Volume 5, PB-257 340.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Water quality, Fishes, Cooling towers, Recommendations, Nuclear power plants, Tables(Data), Wisconsin, Illinois, Indiana, Michigan.
Identifiers: Tributaries, *Water quality data.

No abstract available.

PB-257 340/0GA PC$9.25/MF$3.00
Environmental Protection Agency, Chicago, Ill. Region V.
Conference (4th Session) in the Matter of Pollution of Lake Michigan and Its Tributary Basin in the States of Wisconsin, Illinois, Indiana, and Michigan, Held at Chicago, Illinois on September 19-21, 1972. Volume V.
1972, 297p
See also Volume 2, PB-257 336.

Descriptors: *Water pollution, *Lake Michigan, *Meetings, Ecology, Recommendations, Industries, Law enforcement, Agriculture, Fishes,

Reviews, Residential buildings, Wisconsin, Illinois, Indiana, Michigan.
Identifiers: *Water quality data, Tributaries.

No abstract available.

PB-257 344/2GA PC$5.50/MF$3.00
North Carolina State Univ., Raleigh.
Aerial Photography for Planning and Development in Eastern North Carolina: A Handbook and Directory,
Simon Baker. Apr 76, 112p UNC-SG-76-03, NOAA-76060304
Grant NOAA-04-3-158-46
Sponsored in part by North Carolina State Dept. of Administration, Raleigh.

Descriptors: *Land use, *Recreational facilities, *Aerial photography, *Coastal regions, *North Carolina, Land development, Public land, Manuals, Project planning, Remote sensing, Directories, Photointerpretation.
Identifiers: Sea Grant program, Eastern Region(North Carolina).

The report promotes the use of aerial photography. Aerial photographs of eastern North Carolina are included in this report. The coastal plain portion of the State is engaged in planning for their future development and growth. These aerial photographs will serve as a source of information in the planning and development process.

PB-257 345/9GA PC$4.50/MF$3.00
North Carolina State Univ., Raleigh. Dept. of Civil Engineering.
A Dynamic Water Quality Model for the Neuse Estuary, N.C.
Sea grant pub.,
Michael Amein, and S. G. Wardak. Dec 75, 68p UNC-SG-75-28, NOAA-76060112
Grant NOAA-2-35178, NOAA-04-3-158-40

Descriptors: *Hydrodynamics, *Water quality management, *Neuse River Estuary, *Mathematical models, Water masses, Water flow, Windward drift, Water loss, Runoff, Fresh water, Computer programs, Oxygen, Dissolved gases, Wind(Meteorology), Unsteady flow, Mass flow, Field tests, Ammonia, Inorganic nitrates, North Carolina.
Identifiers: *Water quality data, Dissolved oxygen, Model studies.

The numerical model consists of two parts. The first part employs an implicit method for the solution of the shallow water hydrodynamic equations. The objective of this part of the work is to obtain the values of discharge, velocity and depth in the estuary under the action of freshwater inflow, surface runoff, winds and tides. The second part of the model uses an explicit method for the solution of the unsteady mass-balance equation (equation of mass transport). The objective of this part of the work is to obtain values for concentration of materials in the estuary. The process can be steady or unsteady, the material can be conservative or non-conservative. Applications of the model to the Neuse Estuary are given and the model is tested with field data for ammonia, nitrates and dissolved oxygen.

PB-257 448/1GA PC$4.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Municipal Construction Div.
Cost-Effective Comparison of Land Application and Advanced Wastewater Treatment.
Technical rept.,
Charles E. Pound, Ronald W. Crites, and Robert G. Smith. Nov 75, 33p EPA/430/9-75/016, EPA/MCD-17

Descriptors: *Sewage treatment, *Irrigation, *Cost comparison, Land use, Cost effectiveness, Waste water, Graphs(Charts), Design, Variations, Federal budgets, Local government, Fluid infiltration, Percolation, Tables(Data), Grants.
Identifiers: *Sewage irrigation, *Overland flow, Tertiary treatment.

Contents:
Cost comparison of AWT and land application systems;
Cost comparison of AWT and irrigation systems under variable site conditions;
Variation of cost with conveyance distance and flow capacity;
Land price resulting in equal total costs of AWT and land application systems;
Federal and local share of total costs;
Cost component tables.

PB-257 457/2GA PC$8.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Municipal Construction Div.
Handbook for Sewer System Evaluation and Rehabilitation.
Dec 75, 232p EPA/430/9-75/021, EPA/MCD-19

Descriptors: *Sewage treatment, *Sewers, *Municipalities, Surveys, Handbooks, Fluid infiltration, Performance evaluation, Reviews, Renovating, Water law, Water pollution abatement.
Identifiers: Federal Water Pollution Control Act Amendment of 1972, *Inflow.

The handbook contains chapters on: (1) Methodology for conducting infiltration/inflow analysis; (2) Methodology for conducting Sewer System Evaluation Survey; (3) Information on current state-of-the-art techniques for sewer rehabilitation; and, (4) Costs associated with conducting Sewer System Evaluation Survey and rehabilitation in compliance with the Federal Water Pollution Control Act Amendment of 1972 (P.L. 92-500).

PB-257 520/7GA PC$4.50/MF$3.00
National Oceanic and Atmospheric Administration, Rockville, Md. Office of Coastal Zone Management.
Report to the Congress on Coastal Zone Management July 1974 through June 1975. Public Law 92-583.
Annual rept.
Apr 76, 64p NOAA-76061509

Descriptors: *Coastal zone management, *Project planning, *Law(Jurisprudence), *Budgeting, Research projects, Wildlife, Land use, National government, State government, Federal budgets, Fisheries, Natural resources, Policies, Grants, Tables(Data), Regulations.
Identifiers: Coastal Zone Management Act of 1972, Public Law 92-583, Public Law 93-612, Sanctuaries.

During the Fiscal Year 1975, all of the 30 states eligible to participate, and three of the four territories, began first- or second-year development of their coastal zone programs. This report discusses the Federal and state actions for this period as states worked to meet the fall 1977 deadline suggested by the Coastal Zone Management Act of 1972 (Public Law 92-583) for submission of their programs for Federal approval and matching assistance to carry out the program.

PB-257 604/9GA PC$8.00/MF$3.00
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
Advances in Treatment of Domestic Wastes.
Training manual.
Jan 72, 248p

Descriptors: *Sewage treatment, *Industrial waste treatment, Activated sludge process, Oxidation, Lagoons(Ponds), Concentration(Composition), Ion exchanging, Coagulation, Osmosis, Filtration, Phosphorus, Activated carbon treatment, Sludge disposal, Maintenance, Land use, Industries, Recommendations, Manuals.
Identifiers: Biological industrial waste treatment.

Contents:
Current status and trends;
Basic principles of unit processes;
Improving conventional plant performance.

PB-257 607/2GA PC$13.50/MF$3.00
Northern Great Plains Resources Program, Denver, Colo.
Northern Great Plains Resources Program. Water Quality Subgroup Report,
Jim Shaw, and John Hardaway. Aug 74, 558p
Sponsored in part by Environmental Protection Agency, Washington, D.C., Department of Agriculture, Washington, D.C., and Department of the Interior, Washington, D.C.

Descriptors: *Water quality, *Coal mining, Surface waters, Yellowstone River, Bighorn River Basin, Tongue River Basin, Powder River Basin, Cheyenne River Basin, Belle Fourche River Basin, Missouri River Basin, Heart River Basin, Knife River Basin, Cannonball River Basin, North Dakota, South Dakota, Nebraska, Wyoming, Montana.
Identifiers: Baseline measurements, *Northern Great Plains Region(United States), Western Region(United States).

The report assesses the possible water quality impacts of coal and related energy development upon the following water systems, the Yellowstone, the Bighorn River Basin, the Tongue River Basin, the Powder River Basin, the Cheyenne River Basin, the Belle Fourche River Basin, the Mainstem of the Missouri in North Dakota, the Little Missouri River Basin, the Heart River Basin, the Knife River Basin, and the Cannonball River Basin. The study presents the present (1973-4) water quality of those streams most likely to be affected by such development. The research discusses needs for water use in coal development and water quality impacts most likely associated with development. It shows critical areas where new data should be collected to insure that any development proceeds with minimum adverse impacts in both the short and long term. Also, it discusses quality of waters discharged from energy developments. The paper addresses qualitative impacts on ground water.

PB-257 624/7GA PC$16.25/MF$3.00
Environmental Protection Agency, Washington, D.C. Oil and Special Materials Control Div.
Compilation of Industrial and Municipal Injection Wells in the United States. Volume 1.
Oct 74, 671p* EPA/520/9-74/020-Vol-1
See also Volume 2, PB-257 625.

Descriptors: *Solid waste disposal, *Industrial wastes, *Injection wells, *Site surveys, Inventories, Water pollution, Aquifers, Fluid flow, Monitoring, Geology, Ground water, Deep wells, Hydrodynamics, Tables(Data), Refuse disposal, Design, Mineral deposits, Equipment, Construction, Classification.

This inventory updates a long list of earlier inventories by other regulatory agencies to chronicle the deep waste-injection well situation. As the effects of subsurface pollution are not well understood, it was necessary to gather all data possible regarding practices which may introduce materials to the subsurface. Information was collected for industrial and municipal deep well-injection systems using saline aquifers. Excluded from the inventory were oil field brine injection wells, storage wells and private domestic sewage wells. Comprehensive geologic settings, technical specifications, and operating procedures were recorded and

stored in the STORET computer file. The collected data was assessed to determine current trends. A wide variety of waste waters are injected, including chemicals, petrochemicals, pharmaceutical products, hydrocarbon refining by-products, metal manufacturing wastes, and municipal sewage.

PB-257 625/4GA PC$16.25/MF$3.00
Environmental Protection Agency, Washington, D.C. Oil and Special Materials Control Div.
Compilation of Industrial and Municipal Injection Wells in the United States. Volume 2.
Oct 74, 676p* EPA/520/9-74/020-Vol-2
See also Volume 1, PB-257 624.

Descriptors: *Solid waste disposal, *Industrial wastes, *Injection wells, *Tables(Data), *Site surveys, Inventories, Water pollution, Hydrodynamics, Aquifers, Fluid flow, Ground water, Classification, Deep wells, Refuse disposal, Design, Equipment, Construction, Mineral deposits, Geology, Monitoring.

The data presented is arranged alphabetically by state and numerically within each state to follow the system developed by Warner (1972). The data is presented in a four page format; each page is labelled a-d. In the event that sufficient data is lacking to complete a page of this format that page has been deleted. This data is also available through the STORET/GPSF computer file of EPA. Information on retrieval may be obtained from the STORET User Assistance Group, Division of Monitoring and Data Support, EPA Headquarters.

13C. Construction Equipment Materials, and Supplies

AD-A029 142/7GA PC$6.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Investigation of Accelerated Curing of Soil-Lime and Lime-Fly Ash-Aggregate Mixtures.
Final rept. Sep 73-Mar 76,
Frank C. Townsend, and Robert T. Donaghe.
Aug 76, 129p Rept no. WES-TR-S-76-9

Descriptors: *Soil stabilization, *Calcium oxides, *Fly ash, *Soils, Curing, Acceleration, High temperature, Strength(Mechanics), Time, Temperature, Additives, Concentration(Chemistry), Mixtures.

The objectives of this investigation were to examine current mix design procedures for soil-lime and lime-fly ash-aggregate mixtures and to develop accelerated curing test procedures for estimating long-term field strengths. Unconfined compression tests were conducted on Vicksburg silt (ML) plus 3 and 5 percent lime, Vicksburg buckshot clay (CH) plus 5 and 8 percent lime, and 90 percent clay gravel and 90 percent sandy gravel plus 3 or 6 percent fly ash, respectively. Representative groups of specimens were normally cured at 50 F and 72 F each for 7, 28, and 56 days, while other groups were accelerated cured 1, 3, and 5 days at 90 F, 105 F, and 120 F each. The soil-lime mixtures could be judged to be reactive or nonreactive. Accelerated curing times equivalent to 28-day normal-cure strengths depended upon curing temperature, soil type, and to a lesser extent on lime content or lime: fly ash ratio. Hence, no universally applicable equivalent 28-day curing time exists for accelerated-cured soil-lime or lime-fly ash-aggregate mixtures. Because none of the existing 'maturity' rules for concrete were found to be applicable to soil-lime mixtures, a method was developed based upon normal-cure 7-day and accelerated-cured 105 F strengths for estimating 28-day strengths. Procedures for mix design evaluation of soil-lime and lime-fly ash-aggregate mixtures are presented.

AD-A029 528/7GA PC$4.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Use of Recycled Materials in Airfield Pavements. Feasibility Study.
Final rept. Oct 74-Aug 75,
Raymond J. Lawing. Feb 76, 72p AFCEC-TR-76-7

Descriptors: *Recycled materials, *Pavements, Waste disposal, Concrete, Agglomerates, Reviews, Literature surveys, Feasibility studies.
Identifiers: Portland cements, Bituminous concretes, Aircraft landing fields, *Solid waste disposal.

This report describes an investigation of the economic and technical feasibility of recycling old pavements and used paving materials into new pavement construction and mantenance. It is in effect a state-of-the-art study based on literature reviews and job site visits. Four major procedures were indentified as being used to recycle or reclaim pavements and paving materials. These are: (1) removed and crushed materials, (2) removed and reprocessed materials, (3) pulverized in-place, and (4) heater-planer scarifier or remix methods.

PB-256 431/8GA PC$5.50/MF$3.00
Sydney Univ. (Australia). Civil Engineering Labs.
Cracking in Concrete - Attributed to Defects in Design.
Research rept.,
D. Campbell-Allen, and R. G. Smith. Apr 76, 121p R-286
See also report dated Jan 76, PB-252 920.

Descriptors: *Buildings, *Bridges(Structures), *Concrete construction, Cracks, Crack propagation, Schools, Stadiums, Tanks(Containers), Design standards, Australia.

As part of a project aimed at reducing cracking in concrete, a number of cases of cracking have been examined where the defects could be attributed mainly to inadequacies of design or lack of liaison between the design and construction. Fourteen case studies are presented describing some twenty cracking incidents.

13D. Containers and Packaging

PB-256 979/6GA PC$4.50/MF$3.00
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
Natural Frequencies of Cylindrical Liquid Storage Containers.
Technical rept.,
C. I. Wu, T. Mouzakis, W. A. Nash, and J. M. Colonell. Jun 75, 66p UMASS-GI/39644-1, NSF/RA/E-75/134
Grant NSF-GI-39644

Descriptors: *Earthquakes, *Storage tanks, *Underground storage, Vibration, Resonant frequency, Excitation, Cylindrical shells, Finite element analysis, Computer programs, Earthquake resistant structures.
Identifiers: *Earthquake engineering.

The problem of coupled natural frequencies of a slab-supported elastic circular cylindrical shell filled to an arbitrary depth with an incompressible, inviscid liquid is treated analytically. The analysis permits consideration of a variety of shell boundary conditions. Results are presented in a computer program into which may be entered the elastic and geometric parameters of the system. The natural frequencies and associated mode shapes are displayed in the computer printout.

13E. Couplings, Fittings, Fasteners, and Joints

AD-A029 426/4GA PC$4.50/MF$3.00
National Bureau of Standards Washington D C Mechanics Div
Component Parts Assembly with Joints, Adhesive-Mechanical. Part 4. Analysis and Test of Bonded and Weldbonded LAP Joints.
Final rept.,
Richard A. Mitchell, Ruth M. Woolley, and Saul M. Baker. Mar 76, 75p NBSIR-76-1053, PTA-TR-4965

Descriptors: *Bonded joints, *Adhesive bonding, *Welded joints, *Finite element analysis, Algorithms, Planform, Nonlinear analysis, Loads(Forces), Tensile properties, Fatigue tests(Mechanics), Failure(Mechanics), Mechanical properties, Stresses, Strain(Mechanics), Computer programs, Experimental data, Spot welds.
Identifiers: Lap joints.

Finite element computer techniques were used to study the linear and nonlinear structural response of bonded and weldbonded lap joints. Although the techniques used are applicable to either single-lap or double-lap joints, the emphasis was on the single-lap joint problem with the attendant complication of joint bending. Nonlinear algorithms were developed to account for nonlinear stress-strain charcteristics of the adhesive, and the joined metal sheet, weld-heat softening of the metal sheet, progressive debonding of the adhesive, and nonlinear cyclic loading. The nonlinear modes of response were simulated by sequences of linear solutions. Eight different single-lap joint configurations, designed so as to constitute an experimental parameter study, were studied in a laboratory testing program. Representative specimens were subjected to quasi-static tensile strength and cyclic-load tests and to tensile fatigue tests. The quasi-static and fatigue data generally plot into clear S-N patterns that are in a reasonable relationship to the lap joint design parameters. For the most part, strains measured on the surfaces of the test specimens were in reasonably good agreement with those computed by finite element analysis, provided out-of-plane bending effects were accounted for. The dominant failure modes were consistent with the computer analyses. (Author)

AD-A029 524/6GA PC$6.75/MF$3.00
Vanderbilt Univ Nashville Tenn
Characterization and Measurement of Defects in the Vicinity of Fastener Holes by Nondestructive Inspection.
Final rept.,
Paul F. Packman, R. M. Stockton, and J. M. Larsen. Sep 75, 167p AFOSR-TR-76-0400
Contract F44620-73-C-0073

Descriptors: *Holes(Openings), *Fastenings, *Defects(Materials), *Nondestructive testing, *Ultrasonic tests, *Eddy currents, Bolts, Fatigue(Mechanics), Cracks, Detection, Sizes(Dimensions), Width, Transfer functions, Equations, Metallurgy, Mechanical properties.

This report describes a program designed to develop advanced nondestructive inspection testing and signal processing techniques that can be used to improve the capability and reproducibility of detection of defects associated with fastener holes. Metallurgical and mechanical characteristics associated with flaws in the vicinity of straight shank fastener holes that would influence their detectability were investigated. Two NDI procedures were used: shear wave ultrasonics and eddy current. The results show that crack size, local stresses, width of the crack and material within the crack are primary factors influencing their detectability, with the crack size, crack orientation, and local stress being the dominating factors, par-

ticularly with ultrasonic techniques. Eddy current technique are particularly sensitive to crack size and crack width, but relatively insensitive to local stresses and orientation. The influence of stress level used to grow the defect was also found to be a factor in its detectability, providing no other stresses were applied. A technique using the concept of a transfer function Tr(s) and corresponding Bode plots has been developed that allows recognition of and detection of small 0.030 inch cracks anywhere within the bolt hole scan region. For normal conditions this means that minimum of two scans must be made for each bolt hole. The sensitivity of this technique decreases as the angle of the normal of the crack to the plane of the shear wave increases, i.e. when the crack is perpendicular to the plane of the wave the sensitivity is highest.

AD-A029 658/2GA PC$3.50/MF$3.00
Rensselaer Polytechnic Inst Troy N Y
The Prevention of Hydrogen-Induced Cracking in HY-130 Weldments.
Progress rept. for the year ending 1 Jul 76.
1976, 16p
Contract N00014-75-C-0944

Descriptors: *Steel, *Weldments, *Cracking(Fracturing), Hydrogen, *Hydrogen embrittlement, Martensite, Welds, Heat treatment, Heat, Test methods, Nucleation, Crack propagation.
Identifiers: Steel HY-130.

The present research has the following objectives: (1) To evaluate the interrelationship among the mechanical, metallurgical, and chemical factors responsible for hydrogen-induced cracking in HY-130 steel weldments using the Augmented Strain Cracking Test. (2) To determine the effect of preheat and interpass temperatures and times on level of hydrogen retained. (3) To study, with the aid of acoustic emission technology and both electron and optical microscopy, the mechanisms for nucleation and propagation of hydrogen-induced cracks. (4) To recommend soundly based yet practical procedures for eliminating hydrogen-induced cracking in HY-130 weldments. Testing performed to date has been restricted to a constant augmented strain of 0.5%. This level of strain produces a stress in the outer fibers slightly in excess of the yield stress. Effects of the following are discussed: Hydrogen Content; Preheat; Postheat; Hydrogen Distribution Experiments.

PB-257 180/0GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Engineering Mechanics Section.
Nondestructive Examination of Glass-Reinforced-Plastic Rod End Fittings.
Final rept.,
George F. Sushinsky, and Leonard Mordfin. Apr 76, 28p NBSIR-76-1084
Sponsored in part by Coast Guard, Washington, D.C.

Descriptors: *Fittings, *Nondestructive tests, *Radiography, *Ultrasonic tests, Neutron radiography, Fiberglass reinforced plastics, Rods, Potting, Steels, Aluminum.
Identifiers: End fittings.

An exploratory study was performed on the feasibility of using nondestructive examination techniques to detect voids in two types of potted compression end fittings. Four methods of nondestructive examination were tried: conventional pulse-echo ultrasonics, ultrasonic holography, x-radiography, and neutron radiography. The ultrasonic and x-ray methods that were tried proved unsatisfactory as a nondestructive examination tool for the two types of end fittings, and the neutron radiographic procedures successfully displayed the internal structure on only one of the speciment types. The procedures and results from the different methods of examination are summarized. Additional comments are given regarding the application of the methods to aluminum-jacketed specimens, and regarding improved methods for the inspection of steel-jacketed specimens.

13F. Ground Transportation Equipment

AD-A029 316/7GA PC$3.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
U. S. Army Test and Evaluation Command Development Test II (EP) - Common Test Operations Procedures. 'Standard Obstacles'.
Final rept.
16 Sep 75, 9p Rept no. TOP-2-2-611
Supersedes Rept. no. MTP-2-2-611 dated 1 Sep 65, AD-718 004.

Descriptors: *Road tests, *Military vehicles, Mobility, Performance(Engineering), Test facilities, Assessment, simulation, Test methods, Walls, Climbing, Ramps, Bridges, Tracked vehicles.
Identifiers: *Obstacles, Offroad tracks.

This report provides a method for evaluation of obstacle-negotiating capability; Describes procedures for bridging, wall climbing, trench crossing, frame twisting, and aircraft/landing-craft loading-ramp tests; Discusses obstacle courses to include a profile sketch of each. Excludes slope, fording, washboard, and other standard obstacle tests covered in other TOP's. Applicable to all military vehicles.

AD-A029 677/2GA PC$5.50/MF$3.00
Iowa Univ Iowa City Div of Materials Engineering
Mechanical Design Optimization with Transient Dynamic Response.
Interim technical rept. no. 23, Sep 75-Apr 76,
M. H. Hsiao, E. J. Haug, Jr., and J. S. Arora. Apr 76, 111p
Contract DAAA09-76-C-2013
Doctoral dissertation.

Descriptors: *Vehicles, Transients, Degrees of freedom, Dynamic response, Suspension devices, Steepest descent method, Optimization, Functional analysis, Theses.
Identifiers: *Design optimization, Two degrees of freedom, Five degrees of freedom.

In this report a technique for mechanical design optimization with constraints on transient dynamic response is developed through application of optimal design theory and functional analysis. Cost and constraint functions involving the state variables, design parameters, and environmental parameters are first formulated as extreme value functionals. Three equivalent problem formulations are employed to reduce the extreme value functionals to more elementary functional forms. A generalized steepest descent method is used to solve the reduced optimization problem. Through solution of a test problem, the superior equivalent treatment is selected. Several mechanical system problems involving a family of input or environmental excitation functions are solved to illustrate the technique.

PB-256 828/5GA PC$8.00/MF$3.00
Rohr Industries, Inc., Chula Vista, Calif.
Sound Attenuation Kit for Diesel-Powered Buses.
Final rept. Feb 74-Feb 75,
James C. Berry, and David L. Overgard. Jun 76, 235p DOT-TSC-OST-76-5
Contract DOT-TSC-714

Descriptors: *Buses(Vehicles), *Noise reduction, Diesel engines, Engine mufflers, Cooling fans, Engine noise, Acoustic insulation, Noise pollution.

The Transportation Systems Center (TSC), on behalf of the U.S. Department of Transportation (DOT), initiated a project to assess, demonstrate and document the noise reduction potential of optimized commercially-available exhaust, intake, and fan subsystems on a typical diesel-powered city bus. These subsystems were to be retrofitable designs in current vehicle fleets while maintaining public safety and established vehicle exhaust emission regulations. This report, in response to this effort, is intended to provide a reference for manufacturers, owners, and operators to consult for recommendations or instructions on installing a proven noise-reduction kit. It provides an insight into the causes of diesel-powered bus noise and demonstrates an effective means for its reduction. Appendixes give standard noise measurement procedures, acoustic and performance test data on the various design configurations, and service information on sound attenuation kits.

PB-256 994/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Is the Proposed Federal Standard for Brakes Adequate for Police Patrol Vehicles.
Final rept.,
Jared J. Collard. 1975, 9p
Pub. in Proceedings of Society of Automotive Engineers Automotive Engineering Congress and Exposition, held at Detroit, Mich., on Feb 24-28, 1975, Paper No. 750399, p1-6 1975.

Descriptors: *Motor vehicles, *Safety engineering, *Brakes(Motion arresters), Reliability, Tests, Requirements, Standards.
Identifiers: *Police patrol cars.

In 1972, the National Bureau of Standards surveyed 530 police departments to determine what was wrong with their patrolcars: 449 departments responded to the survey. Thirty-two percent of the respondents, a plurality, identified brakes as the most dangerous feature, and 36% identified it as the system most in need of standards. Ninety-four percent of the respondents rated their patrolcar brakes excellent to satisfactory at speeds under 70 mph (113 kph), but 25% rated them poor over 70 mph. While the new Federal Motor Vehicle Safety Standard 105-75 may improve the brake systems for patrolcars for routine, low speed use with frequent applications, it will be necessary to continue testing patrolcar brakes under severe driving conditions to assure reliability at high speeds.

13H. Industrial Processes

AD-A029 210/2GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Acoustic Imaging of a Titanium Casting.
Interim rept.,
R. J. Sanford, and H. H. Chaskelis. 5 Aug 76, 12p
Rept no. NRL-8031

Descriptors: *Titanium alloys, *Ultrasonic inspection, Ultrasonic tests, Ultrasonic radiation, Nondestructive testing, Castings, Holography, Images, Three dimensional, Ultrasonics, Pressure vessels.
Identifiers: Acoustic imaging, Stereoacoustic imaging.

Various methods of imaging defects were used on a titanium casting 4 in. (100 mm) thick. The techniques, all involving acoustic waves, were C-scan, isometric projection, scanned holography, and a new method called stereoacoustic imaging. The results are compared, and the latter method is shown to provide a true three-dimensional image of the material volume. (Author)

AD-A029 235/9GA PC$4.50/MF$3.00
Air Force Materials Lab Wright-Patterson AFB Ohio
Laser Welding - The Present State-of-the-Art.
Interim rept. Jan-Jul 75,
E. M. Breinan, C. M. Banas, and M. A. Greenfield. Nov 75, 75p Rept no. AFML-TR-75-149

Descriptors: *Laser welding, *Welds, Metals, Ruby lasers, High temperature, High power, Structural properties, State of the art, Aluminum alloys, Titanium alloys.

The evolution of laser systems is briefly reviewed from the first successful operation of the ruby laser in 1960 to the present. Laser materials processing developments are then reviewed followed by general discussions of currently available high power laser equipment, laser welding performance, laser weld characteristics, and the properties of laser welds in metals and alloys. A discussion of current industrial laser welding applications is also included. The report constitutes an effort to comprehensively review the important developments in laser welding up to the summer of 1975. (Author)

AD-A029 349/8GA MF$3.00
Army Foreign Science and Technology Center Charlottesville Va
Determination of Optimal Cutting Regimes Based on Study of Heat-Physical Process using Methods of the Theory of Similitude,
S. S. Silin. 16 Apr 74, 12p Rept no. FSTC-HT-23-1507-73
Trans. of Teplofizika Tekhnologicheskikh Protsessov (Sbornik Nauchnykh Trudov), Kuybyshev, Kuybyshev Polytechnic Institute im, V. V. Kuybyshev (USSR) p46-53 1970.
Availability: Microfiche copies only.

Descriptors: *Cutting, Mathematical models, Mechanical energy, Energy, Heat, Temperature, Optimization, Surface properties, Surface roughness, USSR, Translations.

Similarity theory methods are used to set up the equation of the balance of mechanical and thermal energy per unit time in the cutting of metals. Steps are outlined for finding the optimal cutting temperature without measuring tool wear, as well as for finding the lowest relative surface wear and the optimal surface roughness. (Author)

AD-A029 502/2GA PC$3.50/MF$3.00
Brush Wellman Inc Cleveland Ohio
Production Engineering Measures to Manufacture Super Fine Finish Beryllia.
Quarterly progress rept. no. 7, 1 Apr-30 Jun 76,
K. A. Walsh. 10 Jul 76, 21p Rept no. BW-TR-580
Contract DAAB07-74-C-0606

Descriptors: *Beryllium oxides, *Superfines, Surface finishing, *Substrates, *Production engineering, Sizes(Dimensions), Polishing, Abrasion, Manufacturing, Pilot studies.

The First Article units and a revised Test Report were submitted and accepted by the government. Pilot Run demonstration of the capability of progressive polishing to produce at least 1000 substrates per week of each of three sizes of super fine finish beryllia was completed using installed manufacturing-scale equipment. Working surfaces with 3 to 3.5 microinches surface finish resulted. The input substrates were commercially available 99.5% BeO parts of 1.0 inch by 1.0 inch or 2.0 inch by 2.0 inch dimensions. (Author)

AD-A029 518/8GA Not available NTIS
Machinability Data Center Cincinnati Ohio
Group Technology - An Overview and Bibliography.
State-of-the-Art/Bibliography 1955-1975,
Marvin F. DeVries, Susan M. Harvey, Vijay A. Tipnis, and Inyong Ham. Aug 76, 90p Rept no. MDC-76-601
Contract DSA900-75-C-2071
Prepared in cooperation with Metcut Research Associates, Inc., Cincinnati, Ohio and Pennsylvania State Unit., University Park.
Availability: Paper copy available from Machinability Data Center, 3980 Rosslyn Drive, Cincinnati, Ohio 45209. PC$7.50 domestic. $10.00 foreign.

Descriptors: *Manufacturing, *Technology, *Bibliographies, Batch processing, Fabrication, Classification, Coding, Flow charting, Benefits, Economic analysis, Engineering, Cost effectiveness.
Identifiers: *Group technology.

Using commonly asked questions regarding the adoption of Group Technology systems in manufacturing, an introductory overview is presented. Basic principles are explored, and various aspects such as classification and coding, industrial applications, relationships to NC and CAM, management, human factors and economics are examined. A selected bibliography containing 480 references to literature published in the years 1955-1975 is provided to aid in the location of more detailed information. Subject access is included.

NTIS/PS-76/0723/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Diffusion Bonding (A Bibliography with Abstracts).
Rept. for 1964-Sep 76,
William E. Reed. Sep 76, 167p*
Supersedes NTIS/PS-75/771.

Descriptors: *Bibliographies, *Diffusion welding, Bonded joints, Process control, Fabrication, Mechanical properties, Steels, Refractory materials, Titanium, Dissimilar materials bonding, Composite materials, Nuclear fuels.
Identifiers: *Diffusion bonding.

The processing, metallurgical techniques, diffusion phenomena, bonding mechanisms, and mechanical properties of diffusion bonded joints are investigated in the cited reports. Materials bonded include stainless steels, refractories, titanium, dissimilar metals, composites, reactor fuels, and silicon wafers. (This updated bibliography contains 162 abstracts, 20 of which are new entries to the previous edition.)

PATENT-3 966 855
Not available NTIS
Department of the Air Force Washington D C
Method of Fabricating Silicon Carbide Articles.
Patent,
Glenn W. Hollenberg, and Robert L. Crane.
Filed 22 Feb 74, patented 29 Jun 76, 6p AD-D002 858/9, PAT-APPL-445 046
Supersedes AD-164 736.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hot pressing, *Silicon carbides, *Patents, Engine components, Fabrication.
Identifiers: PAT-CL-264-65.

The patent relates to a method for fabricating silicon carbide articles which comprises hot pressing a homogeneous mixture of carbonaceous particles and silicon carbide powder. The presence of the carbon limits grain growth so that a silicon carbide product having greatly improved physical properties is obtained. The method is suitable for fabricating structural elements, e.g., structural components in the hot sections of air breathing propulsion systems.

PB-256 770/9GA PC$8.00/MF$3.00
National Bureau of Standards, Washington, D.C. Metallurgy Div.
Success by Design: Progress Through Failure Analysis--Proceedings of the Meeting of the Mechanical Failures Prevention Group (21st), Held at National Bureau of Standards, Gaithersburg, Maryland on November 7-8, 1974.
Final special pub.,
T. Robert Shives, and William A. Willard. Jul 76, 232p NBS-SP-433
Library of Congress Catalog Card No. 76-608132. See also PB-248 254. Sponsored in part by Office of Naval Research, Arlington, Va., Frankford Arsenal, Philadelphia, Pa., Naval Air Development Center, Warminster, Pa. and Federal Aviation Administration, Washington, D.C.

Descriptors: *Design criteria, *Failure(Mechanics), *Meetings, Fabrication, Metal cutting, Reliability, Quality assurance, Product development, Value engineering.
Identifiers: *Failure analysis.

These proceedings consist of a group of twenty two submitted papers and discussions from the 21st meeting of the Mechanical Failures Prevention Group which was held at the National Bureau of Standards in Gaithersburg, Maryland on November 7-8, 1974. The central theme of the Proceedings was improvement in design through failure analysis. Emphasis was on design philosophy, the use of failure analysis case studies as an educational tool, successful redesign through failure analysis, and design oversights.

13I. Machinery and Tools

PB-256 016/7GA PC$11.00/MF$3.00
National Aeronautics and Space Administration, Washington, D.C.
Analysis and Synthesis of Mechanisms,
N. I. Levitskii. 1975, 402p NASA-TT-F-680
Trans. of mono. Analiz i Sintez Mekhanizmov, Moscow, 1970, by S. K. Goel, and K. L. Awasthy. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Mechanical drives, *Synthesis, Cams, Linkages, Kinematics, Translations, USSR.
Identifiers: *Levers.

This collection of articles deals with the analysis and synthesis of plane, and spatial mechanisms. Various theoretical and practical problems associated with the design of plane mechanisms as well as of adjustable lever and cam-lever mechanisms are considered. A major part of the book is devoted to articles in which the problems of kinematic and dynamic analysis of cam mechanisms as well as problems of selecting optimum laws of movement of driven links are solved. Mechanisms of certain machines and instruments, e.g., radialpiston multipath hydromotors, molding presses, pneumatic-hydraulic drives for stopcocks and electrical switches are also described in this collection.

13J. Marine Engineering

AD-A029 169/0GA PC$3.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept

Catastrophic Hydroelastic and Side Ventilation Phenomena on High-Speed Hydrofoil Struts.
Final rept.,
Edwin P. Rood, Jr., and Nils L. Dailey. Mar 73, 23p Rept no. SPD-479-10

Descriptors: *Struts, *Hydrofoils, *Ventilation, *Hydrofoil craft, Hydroelasticity, Flutter, Hydrodynamics, High velocity, Catastrophic conditions.
Identifiers: Side ventilation, Divergence.

Struts capable of safely supporting hydrofoils at speeds up to 80 knots cannot be designed using existing strut data. High-speed struts are most susceptible to the hydroelastic problems of flutter and divergence, and the hydrodynamic problem of side ventilation than are low-speed struts. Any one of these three phenomena can produce catastrophic failure of the hydrofoil craft. Divergence is a static loading problem which can be avoided by estimating maximum loads on the strut and designing the strut to withstand those loads. Flutter and side ventilation are complex problems which are not understood completely and which are only now being characterized experimentally. Neither can be predicted by theoretical means at present. There are known technological gaps in the available strut design data which can be filled by the appropriate research recommended in this report. These gaps must be filled to meet the long-range requirement for a design base for high-speed hydrofoils. The immediate requirement for a strut capable of supporting hydrofoils at speeds up to 80 knots demands a practical solution based on experimental model data. The design approach to satisfy this requirement should be threefold: a. Determine the strut profile best suited to avoiding side ventilation even while supporting a possibly superventilating foil. b. Design the strength and sweepback of the strut to be divergence-free by calculation. c. Construct a dynamic model of the semi-final strut-pod-foil system to determine that it is free from flutter. (Author)

AD-A029 186/4GA PC$3.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Effect of a Proturberance and Aspect Ratio on the Inception of Ventilation on a Surface-Piercing Strut in Cavitating Flow.
Evaluation rept.,
R. S. Rothblum, N. L. Dailey, and J. H. Pattison. Jun 72, 18p Rept no. SPD-479-02

Descriptors: *Hydrofoil craft, *Struts, *Ventilation, Cavitation, Hydrodynamics, Aspect ratio, Force(Mechanics), Yaw, Centrifugal force, Low pressure.
Identifiers: *Cavitation flow, *Proturberances.

A 2-foot chord, 12 percent thick, symmetric strut was towed vertically in the high-speed basin at Naval Ship Research and Development Center (NAVSHIPRANDCEN). The purpose of the experiment was to extend a study of the effect of aspect ratio on surface piercing strut ventilation characteristics and to determine the effect of a strut surface proturberance on these characteristics. Increasing the aspect ratio increased the susceptibility to ventilation. A proturberance which extended a small distance below the free surface on the low-pressure side reduced side force coefficients and increased susceptibility to ventilation. The effect of the proturberance when positioned just aft of the leading edge was more pronounced than at midchord or further aft. (Author)

AD-A029 193/0GA PC$4.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
A Theory for High Speed Hydrofoils.
Final rept.,
D. P. Wang, and Young Tsun Shen. Apr 74, 33p Rept no. SPD-479-14

Descriptors: *Hydrofoils, *Hydrodynamic configurations, Theory, Two dimensional flow, Cavitation, Takeoff, High velocity, Pressure distribution, Boundary value problems, Hydrodynamics.
Identifiers: Design, Supercavitating hydrofoils.

A two-dimensional, linearized theory for the purpose of designing high speed hydrofoils is presented. The theory is intended for the development of a foil which will overcome the problems associated with the supercavitating foil at takeoff and at moderate speeds. To accomplish this, a streamlined foil is considered in such a way that part of the profile shape of the foil is prescribed and on the remaining part of the foil the pressure distribution is given. A mixed boundary-value problem is therefore formulated and solved. The resulting foil is intended to be used at takeoff and at moderate speeds. A few examples are given. With the help of control devices, the prescribed part of the foil shape is expected to be used as a supercavitating foil at high speeds.

AD-A029 236/7GA PC$5.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Static Stress Measurements on a Series of Skewed Propeller Blades with an without Forward Rake.
Final rept.,
Robert J. Boswell, Marlin L. Miller, and Richard D. Kader. Aug 76, 82p Rept no. SPD-712-01

Descriptors: *Propellers(Marine), *Propeller blades, Skewness, Hydrodynamics, Loads(Forces), Leading edges, Stresses.
Identifiers: Rake, Warp.

Static strains were measured in a systematic series of five marine propeller blades. The propeller blades have projected skew angle at the blade tip equal to zero, 36 degrees and 72 degrees without rake, and 36 and 72 degrees with sufficient forward rake to place the locus of the section midchord in the propeller plane. This combination of skew and rake is called warp. The primary experiments were conducted with the blades under uniform loading applied with air pressure using specially constructed chambers. Limited supplemental experiments were conducted using concentrated loads. The experimental results under uniform loading were correlated with modified beam theory. Both the experimental results and the modified beam theory indicate that for all the skewed and warped propeller blades evaluated, the largest value of the maximum principal stress is no greater than 1.20 times the maximum prinicipal stress on the unskewed propeller.

AD-A029 243/3GA PC$4.00/MF$3.00
Grumman Aerospace Corp Bethpage N Y
Separation Drag Reynolds Number Effect 64-009 and 64-012 Sections.
Hydrodynamic note,
P. B. Gauthier, and H. R. Wright. Aug 75, 37p Rept no. HS-5

Descriptors: *Drag, Flow separation, Reynolds number, *Hydrofoils, Hydrodynamics, Coefficients, Boundary layer transition, Leading edges, Camber, Hydrodynamic configurations, Lift, Aerodynamic characteristics.

The drag polars for the 64-012 section and the 64-009 section are examined for the effect of Reynolds Number on the separation drag coefficient, Ksep. The result presents one Ksep for the transition fixed at leading edge of midchord and another Ksep when the transition is moving between those two points. The drag bucket is fully defined; i.e., the minimum drag coefficients for leading edge and mid-chord transition are displayed, only for Reynolds Numbers of about 1 to about 6x10 to 6th power. Fixing the transition at the leading edge increases Ksep by a factor of three. This study extended only through the linear lift range in the data. Hydrofoil prototypes of symmetric, 9-12%, 64 series section (if practical) would be defined by the Abbott and Doenhoff data if the drag bucket is neglected. Extrapolation of Abbott and Doenhoff to model test by Reynolds Numbers for the same sections is considerably less certain. Generalization of the structure of these results for other sections will be considered in later notes. This data defines an elegant structure which requires correlation with boundary layer theory for the transition point but time does not permit such an investigation.

AD-A029 334/0GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Selection and Design of Optimum Combat Weapon Systems for Naval Ships.
Study project rept.,
John R. Lastova, Jr. Nov 74, 53p

Descriptors: *Naval planning, *Management planning and control, *Naval procurement, *Naval vessels, Selection, Determination, Methodology, Missions, Decision making, Deficiencies, Cost effectiveness, Shipbuilding, Trade off analyses, Weapon systems, Weapon system effectiveness.

This study report outlines a new management approach for developing improved analytical methods of determination of and subsequent acquisition of optimum combat systems for Naval ships. The study examines the current practices and procedures used in tactical combat system selection and notes the weaknesses and deficiencies. This study also discusses the weaknesses in the current Navy organization as it relates to the assessment of a ship's military mission effectiveness. An organization is proposed during the ship design period that would facilitate the determination and acquisition of optimum combat systems. (Author)

AD-A029 392/8GA PC$4.50/MF$3.00
Stevens Inst of Tech Hoboken N J Davidson Lab
Vessel Maneuvering Simulation.
Final rept. on Phase 3,
Haruzo Eda. Jul 76, 53p SIT-DL-76-1858, USCG-D-86-76
Contract DOT-CG-21877-A

Descriptors: *Naval vessels, *Waterways, *Cargo ships, *Navigation, *Marine safety equipment, *Ship motion, Harbors, Simulation, Maneuverability, Control systems, Equations of motion, Ship motion, Mathematical models, Harbor models, Marine rudders.
Identifiers: *Harbor traffic safety.

Ship maneuvering motion equations were formulated to evaluate maneuvering performance in standard maneuvers, stopping maneuvers, and harbor entering maneuvers with inclusion of various forcing functions such as those due to rudders, propellers, water depth, and control (i.e., autopilot or helmsman). Utilizing available hydrodynamic data and theories, the hydrodynamic coefficients in motion equations were evaluated for a typical medium-size tanker. Subsequently, simulation experiments were carried out for standard maneuvers and compared with available full-scale trials of a similar type tanker. Encouraging correlations were indicated between predictions and full-scale trials of a similar type tanker. Encouraging correlations were indicated between predictions and full-scale test results. Furthermore, harbor-entering maneuvers were carried out on a digital computer for the case of New

York Harbor entering into Kill van Kull from New York Bay. Results demonstrate that this computational procedure is a useful tool to promote harbor traffic safety, although further refinement should be made to achieve realistic modeling of the ship-waterway systems. (Author)

AD-A029 456/1GA PC$6.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Methods for Controlling the Sideforce on Surface-Piercing Hydrofoil Struts.
Final rept.,
Richard S. Rothblum, Michael F. Jeffers, and Russell P. Smith. Jul 76, 127p Rept no. SPD-700-01

Descriptors: *Hydrofoil craft, *Hydrodynamics, *Struts, Force(Mechanics), Control, Methodology, Ventilation, Sideslip, Air flow, Injection, Flaps(Control surfaces), Performance tests, Fences, Bleed systems, Spoilers.
Identifiers: Side force, Surface piercing struts.

Possible means of reducing the sideforce due to sideslip angle on a surface-piercing hydrofoil strut were investigated. An experimental program was performed to test the effect on strut sideforce and ventilation characteristics of 50-percent chord trailing edge flaps, midchord spoilers (split flaps), and airbleed (air injection). The effect of fences was tested in combination with the trailing edge flap and airbleed. All systems were found to be effective in reducing or changing sideforce. Airbleed and spoilers reduced the abruptness of transition to the ventilated state under certain circumstances. Power requirements were evaluated for the case of flapped struts. Fences slightly increased drag, and had a smoothing influence on transition between ventilated and unventilated flow states.

AD-A029 463/7GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Explosion-Bulge Test Performance of Rolled to Extruded HY-80 Weldments.
Memorandum rept. (Final),
P. P. Puzak. 10 Jul 62, 9p Rept no. NRL-MR-1344

Descriptors: *Submarine hulls, *Weldments, Test and evaluation, Steel, Metal plates, Extrusion.
Identifiers: Steel HY-80.

The current submarine design calls for the welding of rolled HY-80 plate sections into T beams which are then formed into circular stiffener rings and welded circumferentially to the pressure hull plating of the submarine. Explosion bulge tests were conducted with composite weldments consisting of rolled HY-80 plate welded to web sections of extruded HY-80 T-shapes. As demonstrated by the results of these tests, the extruded HY-80 is shown to develop approximately equivalent explosion bulge test performance as that of the rolled HY-80. The limited tests, however, suggest that the extruded HY-80 is characterized by greater directionality characteristics than that developed by rolled HY-80.

AD-A029 464/5GA PC$4.00/MF$3.00
Naval Research Lab Washington D C
Explosion-Bulge Test Performance of Machine Welded 1 Inch Thick HY-80 Steel.
Memorandum rept.,
P. P. Puzak. Apr 57, 28p Rept no. NRL-MR-691

Descriptors: *Weldments, *Steel, *Submarine hulls, *Submerged arc welding, *Inert gas welding, Acceptability, Test and evaluation, Metal plates.
Identifiers: Steel HY-80.

Explosion-bulge tests were conducted at 0 F to evaluate the performance of machine welded HY-80 steel intended for submarine hull construction. Three types of welding methods were used to produce the weldments: (1) inert-gas-shielded metal-arc (Code C); (2) submerged arc (Code D); (3) submerged arc (Code E). The performance of automatic weldments involving inert-gas-shielded metal-arc processes were shown to be satisfactory for applications based on 'military service' loading conditions. Automatic weldments involving submerged arc processes (Code B and Code C) were characterized by high birttleness at 0 F of either the weld or HAZ. At their present state of development, submerged arc processes are not considered suitable for HY-80 applications based on 'military service' loading conditions.

AD-A029 646/7GA PC$12.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Los Angeles and Long Beach Harbors Model Study: Report 3. Analyses of Wave and Ship Motion Data.
Technical rept.,
Donald L. Durham, Jack K. Thompson, Douglas G. Outlaw, and Leroy G. Crosby. Jul 76, 463p
Rept no. WES-TR-H-75-4-3
See also Rept. no. AEWES-TR-H-75-4-5, AD-A016 904.

Descriptors: *Ship motion, *Harbors, Los Angeles(California), Water waves, Energy levels, Power spectra, Surges, Oscillation, Excitation, Response, Frequency bands, Mooring, Computations, Prototypes, Measuring instruments, Field conditions, Data acquisition, Statistical analysis, Marine engineering.
Identifiers: Long Beach(California).

This report describes the procedures and presents the results of analyses of prototype ship motion and wave data collected in the Los Angeles and Long Beach Harbors during a 1-yr data acquisition program. In the ship motion analyses, observations of ship characteristics, movement, and mooring line configurations/characteristics are statistically analyzed for various time distributions and concurrences of movement. For various ships and mooring configurations in the East Channel of Los Angeles Harbor, a numerical analysis of moored ship response to wave excitation is conducted to define the periods or frequency ranges of maximum surge response. In the analysis of wave data, estimates of wave energy for wave periods ranging from 15 sec to 3 hr are calculated from the prototype wave data by spectral analyses. Time-dependent spectral estimates are calculated for 10 time periods during which concurrences of medium and/or heavy ship movement occurred. From such spectral techniques, frequency bands containing significant energy levels are identified for 15 wave gage locations in the two harbors. In addition to identifying characteristic frequency bands of wave energy for each gage, the time variation of energy levels within each frequency band and the distribution and/or penetration of swell throughout the harbors are estimated. Observations of adverse ship motion are correlated with time variations of energy levels in characteristic frequency bands. Subjective analyses of analog wave records are conducted to provide indications of frequency of occurrence and wave-height distributions for previously identified wave periods having maximum energy (wave heights).

NTIS/PS-76/0738/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Marine Anchors (Citations from the NTIS Data Base).
Rept. for 1964-Aug 76,
Guy E. Habercom, Jr. Sep 76, 125p*
Supersedes NTIS/PS-75/763, and NTIS/PS-75/014. See also NTIS/PS-76/0739.

Descriptors: *Bibliographies, *Anchors(Structures), Anchoring, Moorings, Ocean bottom, Embedding, Cables(Ropes), Ocean currents, Abstracts.
Identifiers: *Anchors(Marine), *Explosive embedment anchors.

Marine anchors, their design, emplacement methods, and holding power are reviewed in these abstracts of Government-sponsored research reports. The hydrodynamics of anchor mooring systems is also investigated. (This updated bibliography contains 120 abstracts, 14 of which are new entries to the previous edition.)

NTIS/PS-76/0739/3GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Marine Anchors (Citations from the Engineering Index Data Base).
Rept. for 1970-Aug 76,
Guy E. Habercom, Jr. Sep 76, 62p*
See also NTIS/PS-76/0738.

Descriptors: *Bibliographies, *Anchors(Structures), Anchoring, Mooring, Ocean bottom, Embedding, Cables(Ropes), Ocean currents, Abstracts.
Identifiers: *Anchors(Marine), *Explosive embedment anchors.

Marine anchors, their design, emplacement methods, and holding power are investigated in these abstracts of reports reviewed in a worldwide literature survey. The hydrodynamics of anchor mooring systems are also researched. (Contains 53 abstracts)

PATENT-3 960 100
Not available NTIS
Department of the Navy Washington D C
Pressurized Ship Structure for Slamming Loads.
Patent,
Richard B. Chapman. Filed 2 Jun 75, patented 1 Jun 76, 4p AD-D002 841/5, PAT-APPL-583 083
Supersedes AD-D002 571.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ship hulls, *Slamming, *Patents, Catamarans, Flexible structures, Ocean waves, Fabrics.
Identifiers: *Ship slamming, PAT-CL-114-61.

The patent relates to a device whereby the underside of a semisubmerged ship or catamaran-type vessel's platform is protected from the slamming loads created by impacting waves. Elongate flexible chambers are fashioned from a flexible fabric and are arranged in a side-by-side relationship on the platform's bottom. The flexible chambers first resiliently absorb the forces of the impacting waves and then translate these forces into tensile stresses borne by interposed, rigid, structural members. The flexible fabric chambers and rigid structural members do not overly load the platform yet do provide a higher degree of protection for the platform.

PATENT-3 962 672
Not available NTIS
Department of the Navy Washington D C
Tethered Vehicle Location System.
Patent,
Robert L. Watts, and Michael D. Juniper. Filed 16 Jul 75, patented 8 Jun 76, 6p AD-D002 845/6, PAT-APPL-596 329
Supersedes AD-D002 573.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Underwater vehicles, *Position location reporting system, *Patents, Position finding, Hydrophones, Acoustic signals, Frequency division multiplexing, Signal processing, Tethering.
Identifiers: PAT-CL-340-6.

The patent relates to a method whereby the location of a tethered undersea vehicle is determined by functionally cooperating elements on the vehicle, the end of a main cable and a support ship. An acoustic signal is projected from the distal end of the main cable and is received by several hydrophones carried on the vehicle. Frequency multiplexing the time deployed or different phases of the received acoustic signal and transmitting them back to the support craft, permits a processing of the multiplexed signals. This processing gives a visual indication of the vehicle's location with respect to the end of the cable. Since ocean currents can cause a catenary effect in the main cable as it hangs in several thousand feet of water, or the support ship might drift off-station, the tethered vehicle cannot be pulled away from an object of interest on the ocean's floor.

PATENT-3 970 156 Not available NTIS
Department of the Navy Washington D C
Water Weighted Corer.
Patent,
Shale Jack Niskin. Filed 15 Sep 75, patented 20 Jul 76, 6p AD-D002 913/2, PAT-APPL-613 703 Supersedes AD-D001 608.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ocean bottom sampling, *Core sampling, *Samplers, *Patents, Pistons, Free fall, Weight.
Identifiers: PAT-CL-175-6, *Coring devices.

The patent relates to a water-weighted corer comprising a cylindrical tank mounted concentrically on a core barrel intermediate the coring tube and the shackle. The tank has a water inlet at its bottom and an air vent at its top so that during descent water enters the tank through the bottom inlet, forcing air out the top vent. During free fall the falling speed imparts a substantial amount of kinetic energy to the water mass in the tank, providing the driving force required for the corer to penetrate deeply into a sediment bed.

PB-257 197/4GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Fire Performance Testing of Bulkhead Insulation Systems for High Strength to Weight Ship Structures.
Final rept.,
B. T. Lee. Aug 76, 64p NBSIR-76-1012
Sponsored in part by Naval Sea Systems Command, Washington, D.C.

Descriptors: *Ship structural components, *Bulkheads, *Fire resistance, Fire resistant materials, Aluminum, Glass particle composites, Steels, Protective coatings, Fire tests.
Identifiers: *Intumescent paints.

Sixteen insulated aluminum bulkhead specimens were subjected to a material screening process as well as evaluated for their comparative fire performance with a 2-foot horizontal slab furnace. Two insulated and two unprotected glass-reinforced plastic specimens were also tested to obtain fire performance data on these structural materials. In addition, painted aluminum and steel panel specimens were included to determine the fire protective merits of two types of intumescent paints. Potential heat release, smoke, and combustion gas generation were also determined for the insulation and coating materials. Specimens insulated with organic base foams released high levels of combustion gases and could contribute considerable heat to an on-going fire. Specimens insulated with either refractory fibrous material or with mineral wool gave the best overall performance. The same thickness of insulation needed to protect an aluminum panel for over an hour can provide up to 20 minutes of protection for a glass-reinforced plastic panel of the same thickness. The intumescent paints did little to protect the specimens during the fire exposure. Parameters of insulation thickness, heat capacity, density, and thermal conductivity as well as fire duration on specimen temperature were analytically investigated.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

PAT-APPL-689 891/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Scuttling Valve.
Patent Application,
Lionel L. Woolston. Filed 25 May 76, 11p AD-D002 878/7
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Pressure vessels, *Sinking, *Valves, Internal pressure, Springs, Housings(Enclosures), Water entry.
Identifiers: *Patent applications, PAT-CL-137-467.

The patent application relates to a valve assembly which permits the automatic scuttling, or sinking, of floatable pressure vessels or other containers, and comprises an extensible, spring-restrained nozzle containing a spring-biased ball seal within a flow passage. Vessel internal pressure extends the nozzle from a retracted position to expose the exterior end of the flow passage. A calibrated restraining spring ring maintains the nozzle retracted and in the extended position during pressure vessel operation. The ball seal is displaced from a nonsealing position against a ball seat to preclude pressure relief through the flow passage. After exhaustion of internal pressure, the bias spring and external water pressure force the ball seal from the ball seat to permit water entry and subsequent sinking of the vessel.

13L. Safety Engineering

AD-A029 139/3GA PC$7.75/MF$3.00
Oceanics Inc Plainview N Y
Feasibility Study of Mathematical Simulation of Loading Related Recreational Boat Accidents.
Final rept.,
Theodore P. Sargent, Mark N. Silbert, and Paul Kaplan. Dec 75, 202p 75-124, USCG-D-44-76
Contract DOT-CG-81-75-1394

Descriptors: *Boats, *Ship motion, *Accidents, Mathematical models, Ocean waves, Stability, Loads(Forces), Model tests, Safety, Recreation, Standards.
Identifiers: *Recreational boats, *Boating accidents, *Recreational boating.

Results are presented of a feasibility study for mathematically simulating the motions, and resulting accidents, for recreational boats in waves. The mathematical models used to predict boat motions are based on a time domain approach and also by means of (linear) frequency response methods. Results of the simulations are compared with full scale data for two different recreational boats, for which scale model test data was also available. The particular accident simulations carried out considered both swamping and passenger loss of balance.

PAT-APPL-691 122/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Reducing Electrostatic Hazard of CO2 Fire Extinguishers.
Patent Application,
Robert C. Clark, and Joseph T. Leonard. Filed 28 May 76, 10p AD-D002 880/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Fire extinguishers, *Static dischargers, Hazards, Carbon dioxide, Electrostatic charge, Reduction, Safety, Sleeves, Metals.
Identifiers: *Patent applications, PAT-CL-169-35.

The patent application is directed to a method and apparatus for reducing an electrostatic hazard produced during the use of carbon dioxide, CO2, fire extinguishers equipped with a plastic horn or nozzle. A metal sleeve is inserted into the plastic nozzle so that the inner end of the sleeve is in contact with the metal orifice connected to the discharge line of the fire extinguisher. Further, the metal sleeve insert is of less length than that of the nozzle so that the outer end of the nozzle overlaps or extends beyond the end of the metal sleeve. A new discharge nozzle may be made as a separate element which includes a metal sleeve or liner surrounded with a glass cloth reinforced resin sheath bonded thereto.

PB-256 849/1GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Potential Heat: Considerations in the Application of a New Fire Test.
Final rept.,
A. F. Robertson. 15 Sep 75, 6p
Pub. in Fire Material, v1 n1 p9-13 Mar 76.

Descriptors: *Buildings, *Construction materials, *Fire hazards, Fire tests, Flammability, Heat measurement.
Identifiers: *Potential heat.

A review is presented of the nature of the potential heat test method. It is emphasized that the procedure when applied usually yields a property type measurement of the material or composite. As a result care must be taken to insure that necessary supplementary tests are performed by other methods to insure that a substantial fraction of the possible fire hazard has been considered. Suggestions for appropriate use of the procedure are included and a review is made of information available on the precision of the procedure. It is concluded that when properly applied the procedure can serve well as one of the tools for characterizing possible fire hazard. Suggestions are made for possible future development of the procedure to yield information on rate of heat release.

PB-256 861/6GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Comprehensive Survey Program for Fire and Live Loads in Buildings.
Final rept.,
Charles G. Culver. 1974, 36p
Proceedings of Public Buildings Service International Conference on Fire Safety in High-Rise Buildings, Held at Seattle, Wash., November 18, 1974. Prepared in cooperation with General Services Administration, Washington, D.C.

Descriptors: *Fire safety, *Skyscrapers, Surveys, Loads(Forces), Buildings, Factor analysis, Data acquisition, Flame propagation, Models, Mathematical analysis, Building codes, Data processing.
Identifiers: Live loads.

The development of a nation-wide survey program for determining fire loads and live loads in buildings and establishing the factors which affect these loads is described. Considerations involved in planning the program, the type of data collected, data processing procedures and a brief description of the data analysis are included.

PB-256 888/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Early Warning Fire Detection.
Final rept.,
Richard G. Bright. 1975, 17p
Pub. in Proceedings of Fire Protection in Interior Design, Cleveland, Ohio, April 10-11, 1975, p170-184 1975.

Descriptors: *Fire detection systems, *Buildings, Office buildings, Schools, Heat transfer, Flames, Smoke, Reliability, Maintainability, Hospitals, Hotels, Automation, Aerosols.
Identifiers: *Fire research, Smoke detectors, Corridors.

A description of the specialized signatures of fire conditions, along with a description of the various available fire detectors, is presented. Some special problems of fire detectors such as reliability and maintenance are discussed. The paper closes with a discussion of specialized applications of fire detection to open plan office buildings, atriums, schools, buildings with smoke control systems and the use of detectors in corridors.

PB-256 889/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
The Effect of Sample Orientation in the Smoke Density Chamber.
Final rept.,
Leslie H. Breden, and Marta Meisters. 27 Jan 76, 17p
Pub. in Jnl. of Fire and Flammability, v7 (2) p234-247 Apr 76.

Descriptors: *Fire hazards, *Smoke, Test facilities, Directional measurement, Suppressors, Density measurement, Thermoplastic resins, Chemical properties, Combustion, Flow, Fire tests, Flammability.
Identifiers: Vertical orientation, Horizontal orientation, Fire research, Reprints.

Smoke measurements were compared for various materials in the vertical and horizontal positions. There appeared a significant difference for thermoplastic materials because of the melting away from the incident heat flux in the vertical position. The horizontal mode in addition allows one to relate the chemistry of polymeric materials to the amount of smoke production. Finally, smoke measurements are made of products containing various amounts of smoke suppressants.

PB-256 899/6GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Requirements for Fire Safety of Combustible Materials in the United States.
Final rept.,
John W. Lyons. 1975, 17p
Pub. in Proceedings of International Symposium on Fire Safety of Combustible Materials, Edinburgh (Scotland), October 15-17, 1975, 1 p12-25 1975.

Descriptors: *Fire safety, *Buildings, *Meetings, Materials, Flammability, United States, Foreign countries, Research, Test facilities, Legislation, Fire fighting, Smoke, Flame propagation, Losses, Standards, Carpets, Clothing, Bedding equipment.
Identifiers: *Fire research, Combustible materials.

The report contains materials from the Proceedings of a 1975 international symposium on combustible materials held in Edinburgh, Scotland. Among the topics of discussion are U.S. fire codes, a shift from fire endurance in large buildings to single family residences, new fire research tests and programs, standardization of technology, and activities in certain foreign countries.

PB-256 916/8GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
The Development of the National Fire Data System.
Final rept.,
Henry Tovey. Nov 74, 8p
Pub. in Proceedings, NFPA Annual Meeting (77th) held at Miami Beach, Fla. on May 20-24, 1974. Pub. in Fire Jnl., v68 n6 p91-96 Nov 74.

Descriptors: *Fire safety, *Data processing, Information systems, Policies, Reporting, Surveys, Technology, Hazards, Injuries, Losses, Investigations, Systems engineering, Requirements.
Identifiers: National fire data system, Reprints.

The development of the National Fire Data System is described. The major policy requirements established for the system are listed, and four specific categories of fire data needs are defined. The system itself is described in terms of inputs, structure, and outputs, and the system users are classified and described. A report on the current status of the system development effort is given, covering projects on the fire incident reporting subsystem, the national household survey of fire experience, statistical summary data tapes, fire technology information, detailed hazard analyses, and integrated system outputs.

PB-256 992/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
The Large-Scale Fire-Test Facility at the National Bureau of Standards.
Final rept.,
W. J. Parker. 1976, 7p
Pub. in Proceedings from Symposium on Full-Scale Fire Tests Research and Development Center, held at Lancaster, Pennsylvania, on Nov 11-12, 1974, p45-48 1976.

Descriptors: *Fire tests, *Residential buildings, *Test facilities, Fire resistance, Walls, Columns(Supports), Floors, Ceilings(Architecture), Smoke, Flame propagation, Flow, Furniture, Sprinkler systems, Fire fighting.
Identifiers: Room fires, Corridor fires, Fire research.

A newly completed fire test facility at the Gaithersburg site of the National Bureau of Standards provides the capability of studying the fire endurance of columns, walls, and floor/ceiling assemblies; fire growth and control in rooms; fire spread and control in corridors; and smoke movement in buildings. The study of fire growth in a room is concentrated on the role of the furnishings as well as the interior finishing materials. A burn room is also available to examine the fire buildup process in a large item of furniture.

PB-256 998/6GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Development of Flammability Standards.
Final rept.,
John F. Krasny. 1975, 20p
Pub. in Proceedings of Symposium on Textile Flammability (3rd) held at New York, N.Y. on Apr 16-17, 1975, p30-46 1975.

Descriptors: *Fire tests, *Upholstery, *Flammability, *Test facilities, Standards, Ignition, Heat transfer, Textiles, Carpets, Apparel fabrics, Furniture, Hazards, Simulation.
Identifiers: National Bureau of Standards, Fire research, Mushroom test(Flammability).

The activities of the Center for Fire Research of the National Bureau of Standards in the area of textile item flammability standards are described. Work is in progress on a general apparel flammability standard, to replace CS 191-53. A test concept involving a cylindrical fabric specimen, and measurement of the ignitability and the heat release to the inside of the cylinder, is under development. A draft standard for the flammability of upholstered furniture was submitted to the Consumer Product Safety Commission. It consists of a fabric-screening test and test of mock-ups of the fabric, stuffing, tape, etc., arranged as in the furniture piece to be tested. A flooring systems test, to provide a reasonable substitute for the tunnel test, is applicable also to carpets. It consists of exposing a sample to radiation varying in intensity over the specimen length. The specimen is pilot ignited at the high radiation end, and the distance burned until the flames extinguish is measured. This distance can be converted to the 'critical radiant flux' as a measure of potential hazard.

PB-257 000/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Consumer Product Technology.
Standards for Door Security.
Final rept.,
Lawrence K. Eliason. Jun 76, 4p
Pub. in Architectural Metals, v21 n3 p6-7 Jun 76.

Descriptors: *Doors, *Security, Buildings, Building codes, Law enforcement, Performance standards, Requirements.
Identifiers: Reprints.

This article discusses the need for standards for the physical security of door assemblies, describes the nature and application of NILECJ-STD-0306.00, 'Physical Security of Door Assemblies and Components,' and suggests the manner in which the standard can be utilized to improve the security of door assembly components. The implementation of the standard within local building codes is also addressed.

PB-257 006/7GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Estimating Smoke Production During Building Fires.
Final rept.,
A. F. Robertson. May 75, 17p
Pub. in Fire Technology, v11 n2 p80-94 May 75.

Descriptors: *Fire safety, *Smoke, *Density measurement, Methodology, Hazards, Photometry, Buildings, Gas production, Predictions, Estimating.
Identifiers: *Fire research, Reprints.

In the absence of specific analytical methods for measuring the hazards of fire gases there is a trend towards the use of smoke production as a partial measure of this hazard. It is indicated that prediction of smoke concentrations and thus photometric properties during actual fires

requires many important and rather critical assumptions.

PB-257 007/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Field Investigation of Natural Gas Pipeline Accident, Canterbury Woods, Annandale, Virginia.
Final rept.,
R. W. Beausoliel, C. W. Phillips, and J. E. Snell.
May 74, 10p
Pub. in Fire Jnl., v68 n3 p77-84 May 74.
Prepared in cooperation with National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

Descriptors: *Gas pipelines, *Accident investigations, Natural gas, Explosions, Fires, Houses, Leakage, Field tests, Detectors, Damage, Virginia.
Identifiers: *Pipeline accidents, Annandale(Virginia).

On the morning of March 24, 1972, in Annandale, Virginia, two homes were destroyed and a third home damaged by gas explosions and fires resulting from a construction accident that caused the gas main leak. The National Transportation Safety Board was responsible for investigating this accident and requested that the National Bureau of Standards assist them with their investigation by conducting a field test at the accident site. The objective of the test was to determine how the natural gas entered the homes and the paths the gas followed from the leak to the homes. Electronic catalytic leak detectors were used to detect the tracer in homes and elsewhere on the test site. The test results substantiated the basic test premise, and tracer was detected in the basements of the two destroyed homes and the damaged home, but not in the undamaged homes.

PB-257 101/6GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Fire Research.
Fire Spread Along a Mobile Home Corridor.
Interim rept.,
Edward K. Budnick. Jul 76, 56p NBSIR-76-1021
Prepared in cooperation with Department of Housing and Urban Development, Washington, D.C. Energy, Building Technology, and Standards Div.

Descriptors: *Fires, *Residential buildings, *Flame propagation, Fire tests, Walls, Ceilings(Architecture), Materials tests, Ignition, Flammability testing, Comparison, Time.
Identifiers: *Fire spread, *Mobile homes, Corridors, Fire research.

A series of tests was conducted in the corridor area of a typically constructed mobile home. These tests were designed to: (1) evaluate the performance of a variety of combinations of wall and ceiling materials as a result of exposure to a typical ignition in a full-scale mobile home corridor, and (2) determine the relationship between full-scale tests and laboratory flammability tests, particularly the ASTM E-84 tunnel test, a measure of surface flame spread. The tests were restricted to one set of conditions in which the living room at the end of the corridor was exposed to a fire resulting from ignition of a standardized 6.4-kg (14-lb) wood crib. Nine tests were conducted with seven different combinations of wall and ceiling materials.

PB-257 423/4GA PC$4.00/MF$3.00
Federal Fire Council, Washington, D.C.
Fire Services Seminar. Legislation Mutual Aid Fire Reporting OSHA, June 10, 1974.
Final rept.,
William L. Hanbury. Apr 75, 48p FFC-75-1

Descriptors: *Fire safety, *Meetings, Fire departments, Services, National government, Industrial relations, Services, Legislation, Standardization, Reporting, Methodology, Efficiency, Improvement, Agreements, Fire protection.
Identifiers: Mutual aid.

A seminar was held to assist in improving the efficiency of fire department operations by providing a forum for presentation and discussion of current matters of interest to the fire safety community, both federal and nonfederal, which could have an impact on their fire service operations and activities. Topics presented included discussions of current federal fire safety legislation and its impact on the federal fire services; past Comptroller General decisions affecting federal fire protection support agreements; the advantages of uniform fire reporting procedures; and OSHA's impact on the federal fire services.

13M. Structural Engineering

AD-A029 191/4GA PC$6.00/MF$3.00
Cold Regions Research and Engineering Lab Hanover N H
Study of Piles Installed in Polar Snow,
Austin Kovacs. Jul 76, 143p Rept no. CRREL-76-23
Report on Greenland Project 33.

Descriptors: *Pile structures, *Polar regions, Snow, Loads(Forces), Foundations(Structures), Penetration, Greenland.
Identifiers: *Pile foundations, Camp Century(Greenland), Settlement(Structural).

This report describes the study of piles tested in polar snow at Camp Century, Greenland. More than 20 piles of various lengths and sizes were driven, including timber, closed-end and open-end steel pipe piles, and I- and H-piles. The H-piles were instrumented with strain gages. In addition to the driven piles, two purely end-bearing piles were installed in augered holes and five piles were frozen in place using a snow-water slurry. Driving records were obtained and are discussed. Analysis of the driving response of various piles revealed that the Hiley formula, and presumably other similar pile driving formulas, cannot be used to predict the ultimate supporting capacity of piles driven in snow. Factors such as pile inertia, rigidity, size, and tip resistance are discussed in relation to their apparent influence upon pile penetration. Pile load test procedures are described and test results are discussed. It was found that closed-end pipe piles are decidedly inferior to open-end pipe piles in their load-carrying capability and their ultimate supporting capacity. Although pile settlement was found to be dependent upon such variables as pipe load, time, pile shape, and snow temperature, precise effects of these variables were not determined. Nevertheless, the capability of open-end piles to carry quite heavy loads was demonstrated and a procedure is presented for testing these piles in snow.

AD-A029 409/0GA PC$3.50/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Effects of Temperature Cycling on Selected Conductive Flooring.
Final rept.,
Alvin Smith. Aug 76, 11p Rept no. CERL-TR-M-166

Descriptors: *Floor coverings, *Concrete, *Bonding, Explosives, Temperature, Failure, Adhesive bonding.
Identifiers: *Conductive flooring, Coefficient of expansion, Temperature cycling.

This report presents the findings of tests performed to determine the effects of temperature cycling on selected conductive flooring materials bonded to concrete slab substrates. Four specimens of each of two conductive flooring materials-Coroline 510 and Ceilcrete 2500B, both products of the Ceilcote Company-were conditioned to temperatures of -10F (-23.3 C) and 76.4 F (24.7 C). Measurements were made to determine the coefficient of expansion of each of the flooring materials and of the concrete to which they were bonded. The results of the tests indicate that the Coroline 510 is satisfactorily bonded to the concrete within the temperature range indicated, while Ceilcrete 2500B is likely to become unbonded under the same conditions. (Author)

AD-A029 410/8GA PC$3.50/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Compatibility Study of Conductive Flooring.
Final rept.,
Alvin Smith. Aug 76, 19p Rept no. CERL-TR-M-131

Descriptors: *Floor coverings, *Electrostatic charge, *Premature functioning(Ordnance), *Explosives, *Electrical resistivity, Compatibility.
Identifiers: *Conductive flooring.

This report presents the findings of a study performed to assess certain physical properties of four types of conductive flooring-conductive terrazzo, conductive vinyl, conductive rubber, and monolithic trowel-on. The study provides comparative data on which specifications for flooring in explosive manufacturing, loading, and handling facilities can be based. No attempt was made to judge whether any particular material met any existing criteria. The results show a wide range of properties with respect to resistance to chemical attack, spark resistance, and electrical resistivity. (Author)

AD-A029 532/9GA PC$5.50/MF$3.00
Texas Tech Univ., Lubbock. Dept. of Civil Engineering.
Theoretical and Experimental Investigation of Buried Concrete Structures. Volume I. Analysis and Experiment.
Final rept. 1 Apr 74-31 Aug 75,
J. H. Smith, and W. P. Vann. Nov 75, 111p
AFOSR-TR-76-1070, , AFATL-TR-76-55-Vol-1
Grant AF-AFOSR-2720-74
See also Volume 2, AD-A029 539.

Descriptors: *Underground structures, *Concrete, Machine coding, Structural response, Vulnerability analysis, Structural analysis, Soil mechanics, Arches, Finite element analysis, Dynamics, Steel, Prefabrication, Loads(Forces), Nonlinear systems, Theory.
Identifiers: *Buried structures, VANISH computer program.

This report presents the results of two parallel, correlated studies concerning the structural behavior of prefabricated soil-covered concrete arches. One study has been analytical in nature and the other experimental in nature. In the analytical work a computer code has been developed which employs an original finite element method for determining both static and dynamic responses of the soil-structure system of interest. Behavior beyond the linear range is provided for in the code. The code is quite general and should also be useful in analyzing a variety of other structures and the user's manual is present in Volume 2 of this report. The experimental work has consisted of laboratory tests on one-third scale models of the actual 18-foot-radius prototype arches. Both bare and soil-covered arches subjected to static as well as dynamic loads have been considered in the laboratory tests. The primary purpose of the experimental study has been to verify the solutions obtained from the computer code, so that the code can be used with maximum confidence for future studies of various parameters

that are involved in the response of the arch. (Author)

AD-A029 539/4GA PC$4.50/MF$3.00
Texas Tech Univ., Lubbock. Dept. of Civil Engineering.
Theoretical and Experimental Investigation of Buried Concrete Structures. Volume II. User's Guide to Computer Code VANISH.
Final rept. 1 Apr 71-31 Aug 75,
W. P. Vann, and J. H. Smith. Dec 75, 66p
AFOSR-TR-76-1071, , AFATL-TR-76-55-Vol-2
Grant AF-AFOSR-2720-74
See also Volume 3, AD-A029 643.

Descriptors: *Underground structures, *Concrete, Machine coding, Computer programs, Computer program reliability, Subroutines, Interactions, Statics, Arches, Soil mechanics, Flow charting, Digital computers, Nonlinear systems, Theory, Structural analysis.
Identifiers: *Buried structures, Users manuals, VANISH computer program, Aircraft shelters.

This volume provides details concerning the digital computer code, VANISH, which was developed for analyzing the Static And Dynamic behavior of Nonlinear Interacting Soil Structures and the volume is intended to serve as a user's guide to VANISH. In particular, the code has been designed to be efficient and reliable in determining the response of a soil-covered circular arch used as a aircraft shelter. However, it should also be useful in analyzing a variety of other planar structures. Volume 1 of this report, entitled Summary of Analysis and Experiment gives the fundamental concepts underlying the VANISH code. Nevertheless, most of the knowledge needed merely to use the VANISH code is available from the present volume, and requires only a general understanding of how the code actually solves a given problem. (Author)

AD-A029 643/4GA PC$3.50/MF$3.00
Texas Tech Univ., Lubbock. Dept. of Civil Engineering.
Theoretical and Experimental Investigation of Buried Concrete Structures. Volume III. Feasibility Study of Tensile Strain-Rate Sensitivity of Concrete.
Final rept. 1 Apr 74-31 Aug 75,
J. H. Smith, and K. H. Holtsma. Dec 75, 24p
AFOSR-TR-76-1072, , AFATL-TR-76-55-Vol-3
Grant AF-AFOSR-2720-74
See also Volume 1, AD-A029 532.

Descriptors: *Underground structures, *Concrete, Strain(Mechanics), Structural response, Tensile testers, Loads(Forces), Sensitivity, Feasibility studies, Tensile stress, Compressive properties, Dynamics, Theory.
Identifiers: *Buried structures.

For previous research conducted by the project team on the subject of dynamics of buried structures, it was determined that internal blasts excite an arch predominately in a breathing or tensile mode. The critical stresses and strains resulting from such loadings occur in the first few milliseconds after detonation. These critical values, and their relationship to the failure mechanism of plain concrete was the purpose of this research effort. Since a thorough investigation in this area is expensive and time consuming, a short feasibility study was undertaken and a number of reasonably uncomplicated experiments were conducted as a pilot study. Static and dynamic tensile splitting strength tests were performed with varying stress rates. Two loading techniques, an electro-servo-controlled hydraulic and a drop hammer, were tried. While the shape of the loading function was more easily controlled with the hydraulic system, only the drop hammer method was capable of producing the fast (1 to 40 ms.) rise time to failure that was desired. Conclusions were reached that the tensile failure strength of plain concrete can be accurately determined using a drop hammer equipped with a large capacity dynamic load cell (200,000 pound capacity) for rise times in the above mentioned range. (Author)

AD-A029 661/6GA PC$4.50/MF$3.00
Construction Engineering Research Lab (Army) Champaign Ill
Conceptualization of Habitability Expressions for the Habitability Data Base.
Interim rept.,
T. A. Davis. Aug 76, 61p Rept no. CERL-IR-D-68

Descriptors: *Habitability, *Architecture, *Human factors engineering, Data bases, Military requirements, Safety, Health, Cost effectiveness, Military facilities, Military personnel.

Habitability is defined and documents containing statements on habitability are identified within the context of the Corps of Engineers facility delivery process. This process is described as a cycle of events that includes master planning, construction programming, project development, design, and construction. Three generic and ten specific habitability expressions are conceptualized which relate properties of occupant acitvities (physical, physiological, and mental) to properties of facilities (dimensions of length, width, light and sound levels, temperature, etc.). Three expressions of cost-effectiveness are conceptualized as ratios of the dollar cost of a facility, facility property, or property categories divided by units of occupant needs for health, safety, performance and satisfactions. Structural, content, and technical assumptions are given, and data categories are defined by example. Further steps toward the development of prototype expressions are outlined. (Author)

PB-252 848/7GA PC$5.00/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
Seismic Risk Analysis of Discrete Systems,
Ghiath Taleb-Agha, and R. V. Whitman. Dec 75, 80p MIT-CE-R75-48, NSF/RA/E-75-114
Grant NSF-GI-27955
Also pub. as Seismic Design Decision Analysis-23. See also PB-233 856.

Descriptors: *Earthquake resistant structures, *Site surveys, *Risk, Buildings, Dynamic response, Dynamic structural analysis, Dynamic loads, Probability theory, Computer programs.
Identifiers: *Earthquake engineering, *Risk analysis.

Two efficient schemes have been developed for the analysis of systems of discrete sites. Both schemes have the same objective of finding the probability of simultaneous failure of any number of sites belonging to a given system of sites subject to threats from a given set of earthquake sources with known seismic history. In the first scheme, systems with deterministic site resistances can effectively be analyzed using a nonlinear transformation of variables. In the second scheme, systems with random site resistances can be analyzed. To overcome the computational difficulties involved in the analysis, a new set of simple recursive formulae has been developed and used effectively. Based on these two schemes two efficient computer programs were prepared and used to perform a parametric study on a system of nine actual or contemplated nuclear power plants in New England. The results have shown that the problem is very sensitive to the coefficient of variation of the resistances and not so sensitive to the mean resistances.

PB-256 333/6GA PC$4.50/MF$3.00
California State Div. of Highways, Sacramento. Bridge Dept.
Bridge Department EDP Development.
Final rept.,
F. Russell Alves. Jun 73, 66p CA-HWY-BD-7103-2-73-9, FHWA/RD-S0509

Descriptors: *Bridges(Structures), *Structural members, *Data processing, Highway bridges, Loads(Forces), Bridge decks, Girders, Columns(Supports), Structural analysis, California.
Identifiers: *Computer applications.

This report presents the results of an eight-year project of EDP development in subjects of interest to the Bridge Department. The project yielded a substantial collection of usable EDP applications. They emphasize structural analysis and other bridge engineering processes. They also include a variety of management and administrative applications. The report describes project organization and performance, and discusses the resulting applications. Application abstracts are included.

PB-256 540/6GA PC$7.50/MF$3.00
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Studies on the Inelastic Dynamic Analysis and Design of Multi-Story Frames.
Rept. no. 6, Sep 75-Jul 76,
William Harrison Luyties, III, Stavros Aristidou Anagnostopoulos, and John M. Biggs. Jul 76, 197p R76-29
Grant NSF-ATA74-06935
See also report dated Feb 76, PB-253 188. Also pub. as Evaluation of Seismic Safety of Buildings-6.

Descriptors: *Buildings, *Earthquake resistant structures, *Dynamic structural analysis, Earth movement, Dynamic response, Loads(Forces), Elastic properties, Dynamic response.
Identifiers: *Earthquake engineering, *Seismic analysis, Ground motion, FRIEDA computer program.

The inelastic dynamic response of plain frames subjected to earthquake loadings is studied. A sophisticated computer program, FRIEDA, is used for the time integration of the nonlinear equations of motion. First, two models of nonlinear member behavior are compared: the single and the dual component model. Both have been used in the past in nonlinear dynamic analysis studies. Then two real buildings, designed following the ATC-2 procedures, are analyzed for an artificial motion matching the design spectrum. Comparisons between results from modal analysis with inelastic response spectra and those obtained using FRIEDA are made and tentative conclusions are drawn. Finally, the use of inelastic spectra in design is further studied for some other cases.

PB-256 830/1GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Survey of Building Code Provisions for Historic Structures.
Final rept.,
Melvyn Green, and Patrick W. Cooke. Sep 76, 50p NBS-TN-918
Library of Congress catalog card no. 76-600038. Prepared in cooperation with Green (Melvyn) and Associates, Inc., El Segundo, Calif.

Descriptors: *Building codes, Public health, Safety, State government, Local government, Surveys, Recommendations.
Identifiers: *Historic buildings, Conflict resolution, Historic preservation.

In order to resolve conflicts between health and safety objectives and historic preservation objectives, a number of states and cities have adopted special building code provisions. A survey was conducted to determine the extent

of adoption of such special provisions. The survey included the states, territories and member cities of the Association of Major City Building Officials (AMCBO). The survey responses revealed that sixteen of the forty-seven responding states have special provisions or regulations as do fifteen of the twenty-four responding cities. The majority of states and cities have established a special preservation appeals board. Legislation and special provisions are reviewed in the report. Recommendations for additional research are included.

PB-256 831/9GA PC$5.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Survey Manual for Estimating the Incidence of Lead Paint in Housing.
Technical note,
William G. Hall, and Lillian T. Slovic. Sep 76, 114p* NBS-TN-921
Sponsored in part by Department of Housing and Urban Development, Washington, D.C. Energy, Building Technology, and Standards Div.

Descriptors: *Residential buildings, *Lead poisoning, Children, Manuals, Surveys, Toxic diseases, Estimating, Hazardous materials, Sampling, Occurrence, Objectives, Costs, Data processing, Questionnaires, Criteria, X ray fluorescence, Tables(Data).
Identifiers: *Lead based paints, Lead paint poisoning, Appendices, Toxic hazards, *Environmental health.

The manual is intended as a guide for municipal managers in performing a survey to determine the prevalence of lead based paint in their community's dwelling units. There are four parts to the Manual, each is intended for a different audience. Part I discusses the preliminary considerations for a survey. It is intended for the department head or executive who will initiate plans for the survey. It presents a managerial overview of the processes, the cost determinants, criteria for the establishment of objectives and the resources required. Part II is intended for the survey manager and the inspector supervisors. It contains more detailed information on the planning, staffing, training, and execution of the data collection phase of the survey. Part III is for the use of the person responsible for the control and management of the data collected and for the analysis of these data. The Appendices contain quite detailed information about procedures used in previous surveys. These may be used as they are described or may be modified or adapted to meet specific objectives.

PB-256 867/3GA Not available NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Transforming Environmental Research into Regulatory Policy.
Final rept.,
Francis T. Ventre. 1975, 10p
Pub. in Paper in Responding to Social Change, p277-284 1975.

Descriptors: *Building codes, *Construction management, *Policies, Regulations, Design standards, Technology, Management planning, Social effect, Information systems, Methodology.

The report outlines a means enabling environmental design researchers to participate in the formulation of regulatory policies affecting buildings. The standards system is shown to be an underused channel for relaying research findings to building professionals, and the regulatory system is shown to be a potential means for directing building technology toward socially-valued ends. Notes include a brief listing of standards- and codes-generating organizations.

PB-256 897/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Occupant Comfort as a Decision-Making Concept for Air Conditioning of Buildings.
Final rept.,
F. J. Powell, T. Kusuda, and J. E. Hill. 1973, 25p
Pub. in Proceedings of CIB Commission W45 (Human Requirements) Symposium on Thermal Comfort and Moderate Heat Stress, Watford (England), September 13-15, 1972. Paper in Thermal Comfort and Moderate Heat Stress, p191-215 1973.

Descriptors: *Air conditioning, *Houses, *Comfort, Human factors engineering, Habitability, Temperature, Humidity, Weather, Computerized simulation, Heat transfer, Statistical analysis, Design criteria, New Jersey, Georgia.
Identifiers: Jersey City(New Jersey), Macon(Georgia).

A rationale for improving air-conditioning criteria is given. A new research approach and concept are presented. The concept is to include in criteria the effect of the building envelope and the response of humans to the resultant indoor temperature and relative humidity in addition to weather data which are normally used to make decisions concerning air conditioning for buildings. The concept involves generation of a 'Predicted Indoor Habitability Index' (PIHI) as a means to evaluate the response of occupants to short-term as well as long-term exposure in non-air-conditioned housing. The work completed thus far is described. The results of a pilot study for two locations, Jersey City, New Jersey and Macon, Georgia, are presented to demonstrate the feasibility of the concept. The indoor temperature and humidity were determined by calculation using a computerized simulation technique which follows a detailed heat transfer analysis of the weather/building/human-body systems.

PB-257 102/4GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Air Leakage Measurements in a Mobile Home.
Final rept.,
Charles M. Hunt, Stephen J. Treado, and Bradley A. Peavy. Jul 76, 27p NBSIR-76-1063
Prepared in cooperation with Federal Energy Administration, Washington, D.C.

Descriptors: *Residential buildings, *Leakage, *Air flow, Environmental tests, Test chambers, Wind, Simulation, Energy, Losses.
Identifiers: *Mobile homes, Sulfur hexafluoride, Air infiltration, Energy conservation.

Air leakage measurements were made in a mobile home using sulfur hexafluoride (SF6) as a tracer gas. The home was located in an environmental chamber where it was possible to measure and control the temperature outside the home. The effect on infiltration rate of a number of variables was determined. These included inside-outside temperature difference, simulated wind, installation of storm windows, opening of doors, and operation of the furnace fan. Experiments were also performed in which a fan was sealed to an opening in the house and inside-outside pressure difference measured as the fan blew air into or out of the structure at measured rates.

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

AD-A029 495/9GA PC$7.75/MF$3.00
Air Force Test and Evaluation Center Kirtland AFB N Mex
Cost of Ownership Handbook.
May 76, 218p
Errata sheet inserted.

Descriptors: *Cost analysis, *Cost estimates, *Handbooks, *Life cycle costs, *Defense systems, Models, Military procurement, Aircraft, Manpower, Maintenance.
Identifiers: *Cost of ownership, Subsystems, Overhead.

This handbook provides a definition of cost of ownership (operating and support costs) and provides the methodology for estimating and analyzing cost of ownership of systems and subsystems. All costs incident to ownership are considered including associated overhead costs. Included in the handbook is a generalized model which can be adapted to diverse systems and subsystems. Suggested data sources are included to guide users in data collection. (Author)

14B. Laboratories, Test Facilities, and Test Equipment

AD-A029 239/1GA PC$4.50/MF$3.00
Artec Associates Inc Hayward Calif
Dynamic Calibrator for Airblast Pressure Gages to 10,000 PSI.
Final rept.,
Stephen P. Gill, and Michael B. Gross. 27 Feb 76, 59p FR-114, DNA-3920F
Contract DNA001-75-C-0041

Descriptors: *Pressure gages, Overpressure, High pressure, Shock tubes, Manportable equipment, Airburst, Calibration, Costs, Fabrication.
Identifiers: Design.

A compact inverted shock tube concept is recommended for a field-portable airblast pressure gage calibrator in the pressure range 100 - 10,000 psi. This concept meets all operational and performance specifications agreed upon by DNA and the user community. (Author)

AD-A029 263/1GA PC$3.50/MF$3.00
Army Inst of Dental Research Washington D C
Separation of Long and Short Chain Fatty Acids as Naphthacyl and Substituted Phenacyl Esters by High Performance Liquid Chromatography.
Rept. for Sep 75-Aug 76,
Howard C. Jordi, and David Rusilko. 23 Aug 76, 25p

Descriptors: *Liquid chromatography, *Chemical analysis, *Fatty acid esters, Separation, Fatty acids, Halogen compounds, Chlorine compounds, Acetophenones, Bromine compounds, Ultraviolet detectors, Experimental design.
Identifiers: *Acetophenone/bromo, *Acetophenone/chloro, *Acetophenone/nitro, *Acetophenone/naphthyl.

High performance liquid chromatography of various C2 - C24 fatty acids was run on their p-bromophenacyl, p-nitrophenacyl, p-chlorophenacyl, and 2--naphthacyl esters. All the separations were accomplished using reversed phase columns with the eluent consisting of an acetonitrile:water gradient. For all derivatives tested the separations were well defined and analogous although certain esters eluted together as one peak. Quantitative results indicate that the limit of detection in the present study was two picograms of n-caproic acid and 10 picograms of arachidonic acid as their p-bromophenacyl esters.

AD-A029 454/6GA PC$5.00/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Ground Equipment/Materials Directorate
Quantification of Flaws in Fibered Composite Structures Using Interferometric Fringe Patterns.
Technical rept.,
B. R. Mullinix, W. F. Ranson, W. F. Swinson, and T. L. Cost. 20 Apr 76, 96p Rept no. RL-76-18

Descriptors: *Nondestructive testing, *Holography, *Fiber reinforced composites, Defects(Materials), Diffraction analysis, Interferometry, Lasers, Finite element analysis, Cylindrical bodies, Shells(Structural forms).

The study concerns the nondestructive detection and quantification of flaws and voids in thin, cylindrical, fiber reinforced, composite, structures. Three different types of flaws were investigated using real-time and double exposure optical holography, and Young's Fringe method of speckle interferometry. The theory for each technique and photographs of the fringe patterns are presented. The fringe density plots were made by both manual and computer methods and the flaw sizes were determined. The displacements and strains were computed. A computer program using conventional finite elements was used to theoretically compute the displacements near the border of the flaws. A new crack tip element was suggested to improve the results in the region of the flaw border. The results show that flaws in their fiber reinforced composite structures can be detected and the size determined by either optical holographic or speckle interferometric techniques.

AD-A029 571/7GA PC$6.75/MF$3.00
Acurex Corp Mountain View Calif Aerotherm Div
Recovery Tube Trade-Off Study for Reentry Ground Test Facility.
Final rept. 30 Jun 75-1 May 76,
T. C. Derbidge , and T. J. Dahm. Sep 76, 158p
Aerotherm-TR-76-196, AEDC-TR-76-115
Contract F40600-75-C-0001

Descriptors: *Tracks(Aerodynamics), Test facilities, *Guided projectiles, Reentry vehicles, Recovery, Trade off analyses, Computerized simulation, Atmosphere entry, Deceleration, Ablation, Structural response, Boundary layer.
Identifiers: Recovery tubes.

An analytical study was performed to optimize the design of a projectile recovery tube for a large scale track guided projectile range for testing reentry vehicles. The projectile is recovered in this device by guiding it with a track into a compartmented tube where it compresses gas and is thus decelerated by pressure forces. The recovery tube design was optimized to produce minimum projectile damage and system cost. Projectile damage due to ablation, structural loading, and material property changes where analytically predicted for a matrix of recovery tube design options. Model damage was found to be small in all cases.

PAT-APPL-461 834/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Optical Temperature Probe.
Patent Application,
Thomas C. Rozzell, Curtis C. Johnson, Carl H. Durney, and James L. Lords. Filed 18 Apr 74, 16p AD-D002 861/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Temperature measuring instruments, *Laboratory equipment, Probes, Tissues(Biology), Irradiation, Microwaves, Electromagnetic radiation.
Identifiers: PAT-CL-73-190, *Patent applications.

The patent application discloses a temperature probe which measures temperature changes of biological tissue while the tissue is being irradiated with biological tissue while the tissue is being irradiated with microwaves. The temperature probe is completely nonmetallic to minimize perturbation of the microwave field, and the structure of the probe includes a plurality of optic fibers which carry light to and from a reflective liquid crystal film. The liquid crystal is enclosed in a housing at the tip of the probe which is in contact with the biological tissue, and the liquid crystal undergoes changes in absolute reflectance proportional to the temperature changes of the tissue.

PAT-APPL-464 604/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Apparatus for Collecting Deep-Sea Sediment Pore Water.
Patent Application,
Ross O. Barnes. Filed 26 Apr 74, 18p AD-D002 862/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Oceanographic equipment, *Samplers, *Deep oceans, *Sediments, *Ocean bottom sampling, Collection.
Identifiers: *Patent applications, PAT-CL-73-425, Pore water.

The patent application relates to oceanographic sediment-collecting instruments, and in particular, to means for collecting the pore water of deep-sea sedimentary deposits. The collector filters and encapsulates pore water, in-situ, from unconsolidated sediments. A pressure casing mounts a collection cylinder having a valved inlet opening for receiving the sediment pore water through a 1 micrometer filter. The valve is spring pressed to a closed position and opens in response to hydrostatic pressure. A second valve closes the inlet to the spring-pressed poppet valve. Trigger means initiate the opening of the second valve to expose the poppet valve to the hydrostatic pressure. Preferably, the exposure is accomplished in a delayed manner to assure proper positioning of the sampler before admission of the pore water to the cylinder.

PAT-APPL-543 745/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Transient Event Data Acquisition Apparatus for Use with Radar Systems and the Like.
Patent Application,
Todd A. Cerni, and Edmund Philip Krider. Filed 24 Jan 75, 24p AD-D002 863/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Data acquisition, Transients, Radar signals, Meteorological radar, Signal processing, Real time.
Identifiers: *Patent applications.

The patent application relates to apparatus which detects in real time the amplitude and range of certain transient events such as lightning discharges, the arrangement being such that a transient event which is capable of producing a return echo signal initially greater than other return signals is detected and the amplitude and range acquired in a manner which permits recording on moderate speed recording devices.

PATENT-3 958 157 Not available NTIS
Department of the Navy Washington D C
Oil Level Detection Circuit.
Patent,
Kwang-ta Huang. Filed 12 Feb 75, patented 18 May 76, 4p AD-D002 899/3, PAT-APPL-549 396
Supersedes AD-D001 757.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Liquid level gages, *Patents, Oils, Water, Interfaces, Detection, Circuits.
Identifiers: PAT-CL-317-123.

The patent relates to a circuit for detecting the level of oil in an oil-collecting chamber containing oil floating on water. A pair of electrodes are disposed in the oil-collecting chamber for detecting the presence of oil therein. A sensing circuit, connected between the electrodes and an amplifier, contains a sensing current when water or air surrounds the electrodes. The amplified sensing current switches a transistor on transmitting a d-c voltage to an open type solenoid valve located in an outlet tube thereby closing the valve.

PATENT-3 961 291 Not available NTIS
Department of the Navy Washington D C
Apparatus and Method for Mapping Acoustic Fields.
Patent,
Harper John Whitehouse, and Tibor G. Horwath. Filed 29 Nov 74, patented 1 Jun 76, 9p AD-D002 843/1, PAT-APPL-528 176
Previously filed as PAT-APPL-319 124, 29 Dec 72.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Acoustic measurement, *Patents, Acoustic fields, Mapping, Pressure, Transducers, Measuring instruments.
Identifiers: PAT-CL-333-31.

The patent relates to a new apparatus and method of mapping acoustic pressure fields. It uses the interaction of the acoustic field with a high frequency electromagnetic wave in a distributed transducer. The inherent capability of the concept of operating with high date rates without undue complexity of implementation renders it attractive to applications requiring high resolution and high speed.

PATENT-3 961 520 Not available NTIS
Department of the Navy Washington D C
Apparatus for Mechanically Exercising Bourdon Tube Gauge.
Patent,
Tommie R. Modgling. Filed 27 May 75, patented 8 Jun 76, 6p AD-D002 906/6, PAT-APPL-580 653
Supersedes AD-D002 050.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure gages, *Calibration, *Patents, Pivots, Mechanical working.
Identifiers: PAT-CL-73-4, *Bourdon tubes.

Bourdon tubes should be exercised prior to each calibration by causing the tube to move repeatedly through its normal coiling and uncoiling arcs amounts sufficient to produce full scale deflection of the gage pointer. The exercising movements conventionally have been accomplished by applying pressure inside the tube. It has been found that these exercising movements can be accomplished with equal reliability and considerably less expense by engaging the tube end with a pivoted lever and by using a control screw for pivoting the lever. The patent describes such a device.

PATENT-3 970 855 Not available NTIS
Department of the Navy Washington D C

Positron Probes for Mechanical Fatigue Detection System.
Patent,
William H. Holt, and Willis Mock, Jr. Filed 23 May 75, patented 20 Jul 76, 6p AD-D002 915/7, PAT-APPL-580 447
Supersedes AD-D001 263.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Probes, *Nondestructive testing, *Patents, Positrons, Metals, Fatigue.
Identifiers: PAT-CL-250-493.

The patent relates to positron-emitting probes that have certain features that facilitate the use of positrons for nondestructive testing of fatigued metals. The features include the use of an unfatigued substrate for supporting the positron-emitting material, electric and/or magnetic fields to concentrate the positrons on the test item, and a thin scintillator window for use with those radioactive materials that emit a positron without emitting a time-correlated gamma photon.

PB-256 524/0GA PC$4.00/MF$3.00
National Bureau of Standards, Washington, D.C.
A New Dynamic Pressure Source for the Calibration of Pressure Transducers.
Final rept.,
Carol F. Vezzetti, John S. Hilten, J. Franklin Mayo-Wells, and Paul S. Lederer. Jun 76, 38p NBS-TN-914
Contract NASA-L-88319

Descriptors: *Pressure sensors, *Calibrating, Pressure, Sources.
Identifiers: Pressure transducers.

A dynamic pressure source is described for producing sinusoidally varying pressures of up to 34 kPa zero-to-peak, over the frequency range of approximately 50 Hz to 2 kHz. The source is intended for the dynamic calibration of pressure transducers and consists of a liquid-filled cylindrical vessel, 11 cm in height, mounted upright on the armature of a vibration exciter which is driven by an amplified sinusoidally varying voltage. The transducer to be calibrated is mounted near the base of the thick-walled aluminum tube forming the vessel so that the pressure-sensitive element is in contact with the liquid in the tube. A section of the tube is filled with small steel balls to damp the motion of the 10-St dimethyl siloxane working fluid in order to extend the useful frequency range to higher frequencies than would be provided by an undamped system. The dynamic response of six transducers provided by the sponsor was evaluated using the pressure sources; the results of these calibrations are given.

PB-256 857/4GA PC$7.50/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
Guidelines for Development of a Quality Assurance Program. Volume IV. Determination of Particulate Emissions from Stationary Sources,
Franklin Smith, and Denny E. Wagoner. Aug 74, 182p* EPA/650/4-74/005d
Contract EPA-68-02-1234
See also Volume 3, PB-240 354.

Descriptors: *Quality assurance, *Particles, *Manuals, *Air pollution, Quality control, Gas analysis, Sources, Flue gases, Auditing, Laboratory equipment, Field tests, Monitoring, Gas sampling, Numerical analysis, Design criteria, Performance evaluation, Calibrating, Chimneys, Concentration(Composition), Errors.
Identifiers: Point sources, Procedures.

This document presents guidelines for developing a quality assurance program for Method 5, Determination of Particulate Emissions from Stationary Sources. It is divided into four sections: Introduction; Operations Manual; Manual for Field Team Supervisor; Manual for Manager of Groups of Field Teams. The objectives of this quality assurance program for Method 5 are to: Identify and where possible eliminate systematic errors (biases) and maintain precision within acceptable limits in the measurement process; Provide routine indications for operating purposes of satisfactory performance of personnel and/or equipment; Provide for prompt detection and correction of conditions that contribute to the collection of poor quality data; Collect and supply information necessary to describe the quality of the data. Implementation of a properly designed quality assurance program should enable measurement teams to achieve and maintain an acceptable level of precision and accuracy in their stack gas-composition measurements. It will also allow a team to report an estimate of the precision of its measurements for each source emissions test.

PB-256 858/2GA PC$6.75/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
Guidelines for Development of a Quality Assurance Program: Volume XI. Determination of Beryllium Emissions from Stationary Sources,
P. S. Wohlschlegel, F. Smith, and D. E. Wagoner. Apr 76, 156p* EPA/650/4-74/005k
Contract EPA-68-02-1234
See also Volume 4, PB-256 857.

Descriptors: *Quality assurance, *Manuals, *Beryllium, *Air pollution, Quality control, Field tests, Sources, Laboratory equipment, Calibrating, Performance evaluation, Spectrophotometry, Numerical analysis, Monitoring, Gas analysis, Combustion products, Gas sampling, Flue gases, Auditing, Chimneys, Errors.
Identifiers: Point sources, Procedures.

Contents:
- Operations Manual--(Apparatus selection, Equipment calibration, Presampling preparation, On-Site measurements, Postsampling operations (base laboratory));
- Manual for Field Team Supervisor--(Assessment of data, Suggested performance criteria, Collection and analysis of information to identify trouble);
- Manual for Manager of Groups of Field Teams--(Functional analysis of test method, Action options, Procedures for performing a quality audit, Data quality assessment).

PB-256 859/0GA PC$6.00/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
Guidelines for Development of a Quality Assurance Program: Volume XV. Determination of Sulfur Dioxide Emissions from Stationary Sources by Continuous Monitors,
Pamela Wohlschlegel. Mar 76, 127p*
EPA/650/4-74/005o
Contract EPA-68-02-1234
See also Volume 14, PB-244 167.

Descriptors: *Quality assurance, *Sulfur dioxide, *Manuals, *Air pollution, Quality control, Gas analysis, Monitoring, Sources, Performance evaluation, Tables(Data), Field tests, Sites, Design criteria, Numerical analysis, Combustion products, Particles, Flue gases, Auditing, Chimneys, Errors, Gas sampling.
Identifiers: Point sources, Procedures.

Guidelines for the quality control of the continuous measurement of sulfur dioxide emissions by Performance Specification 2 are presented. These include: (1) Good operating practices; (2) Directions on how to assess performance and to qualify data; (3) Directions on how to identify trouble and to improve data quality; (4) Directions to permit design of auditing activities. The document is not a research report. It is designed for use by operating personnel.

PB-256 910/1GA PC$7.50/MF$3.00
Research Triangle Inst., Research Triangle Park, N.C.
Development Strategy for Pollutant Dosimetry.
Final rept.,
J. W. Harrison, P. A. Lawless, D. E. Gilbert, and J. H. White. Feb 76, 195p EPA/600/2-76/034
Contract EPA-68-02-1731

Descriptors: *Dosimetry, *Sulfur dioxide, *Nitrogen dioxide, *Ozone, Air pollution, Sampling, Monitoring, Performance evaluation, Measuring instruments, Sorption, Sorbents, Electric current, Halogens, Colorimetric analysis, Luminescence, Gas ionization, Electrophoresis, Piezoelectricity, Design criteria, Public health, Cost estimates.
Identifiers: *Air pollution detection.

This report comprises the results of a study to: (1) Define and place realistic limits upon the needs of epidemiologists for personal pollutant dosimeters; (2) Identify pollutant-sensing principles that offer reasonable opportunity for early development of functioning dosimeters capable of operating with the limits of (1) above; (3) Project the impact of mechanical and electronic miniaturization techniques upon each of the principal options disclosed in (2) above; (4) Assess the cost/benefit aspects of active vs. passive sampling of the atmosphere, as applied to candidate sensors identified in (1), (2) and (3) above; (5) Assess the advantages, if any, of a systems approach to dosimeter development, in which the design of a sensor for a given pollutant would be constrained to make maximum use of components and subassemblies common to sensors for other pollutants. The study reported on has been arbitrarily limited to consideration of devices applicable to the measurement of ozone, sulfur dioxide and nitrogen dioxide. The principles developed will apply in some degree to the eventual design of dosimeters for other pollutants.

PB-257 005/9GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C. Programmatic Center for Fire Research.
Two Smoke Test Methods - A Comparison of Data.
Final rept.,
A. F. Robertson. Nov 74, 8p
Pub. in Fire Technology, v10 n4 p282-286 Nov 74.

Descriptors: *Smoke, *Density measurement, *Fires, Test equipment, Great Britain, United States, Technology, Methodology, Comparison, Performance evaluation.
Identifiers: *Fire research, *Smoke density chambers, Reprints.

Smoke test methods have been developed in both UK and USA which are based on photometric measurements of smoke accumulation in closed chambers. The British Fire Research Station (FRS) procedure makes use of a large room approximately 37 times the volume of the box type chamber used in the test developed at the National Bureau of Standards (NBS). Tests have been conducted to compare the ability of the two measurement methods to assess smoke production from samples of selected materials. It is concluded that similar smoke measurements are obtained by use of the NBS procedure and use of the NBS specimen pyrolysis equipment in the room used for the FRS test.

PB-257 206/3GA PC$3.50/MF$3.00
National Oceanographic Instrumentation Center, Washington, D.C.
Automatic Dissolved Oxygen Meter Model 2010-00A.
Instrument fact sheet.
Jun 76, 13p IFS-76008, NOAA-76061001

Descriptors: *Oceanographic surveys, *Oxygen, *Dissolved gases, *Measuring instruments, Automatic control, Experimental design, Oxygen supply equipment, Polarographs, Thermistors.
Identifiers: *Oceanographic equipment.

The Delta Scientific Corp. Model 2010-00A is a multirange instrument designed to measure dissolved oxygen in water. The analyzer consists of an instrument housing, dissolved oxygen probe, and an optional remote stirrer. The instrument housing contains the electronic circuits, an analog panel meter for data readout, six AA 1.5-volt batteries, and a socket for connecting the probe cable. An analog output signal is provided which is suitable for recording dissolved oxygen data.

14C. Recording Devices

AD-A029 238/0GA PC$4.00/MF$3.00
Philips Labs Briarcliff Manor N Y
Development of an Optical Disc Recorder.
Quarterly technical rept. 1 Apr-30 Jun 76,
George Kenney, D. Lou, J. Wagner, A. Chan, and T. Demetrakopoulos. Aug 76, 50p Rept no. PL-21-YR76-0815
Contract N00014-76-C-0441, ARPA Order-3080

Descriptors: *Disk recording systems, *Optical equipment, *Metal films, *Optical coatings, Laser spots, Substrates, Bismuth, Tellurium, Thermal stability, Selenium, Digital systems.
Identifiers: DRAW(Direct Read After Write), Direct read after write, Laser machining, Arsenic selenides.

First testing of the recorder is underway. Some tracks were recorded on plastic discs coated with tellurium films. Laser machining of holes in static films of various materials reveals tellurium as an attractive DRAW candidate. The principle advantages of tellurium film (compared to bismuth) are improved sensitivity and stability at high temperature. Detailed analysis of the air-sandwich protective mechanism continues. The first results of the digital coding task force study are being analyzed. A study of accelerated life testing of bismuth and tellurium film was initiated. (Author)

14E. Reprography

AD-A029 366/2GA PC$3.50/MF$3.00
Army Mobility Equipment Research and Development Command Fort Belvoir Va
Spectral Reflectance Evaluation of Camouflage Detection Photography.
Final rept. 1974-1975,
Fred L. Lafferman. May 76, 20p Rept no. USAMERDC-2177

Descriptors: *Camouflage, *Infrared photography, *Foliage, Colors, Deception, Reflectance, Spectral emittance.
Identifiers: *Camouflage detection, Camouflage coating reflectance, Camouflage materials, Spectral properties, Pigments, *Spectral reflectance, Spectrum signatures.

For artificial camouflage materials to react the same as foliage toward camouflage detection photography, it is necessary for the colors to possess the same characteristic spectral curve as foliage. Camouflage detection photographic film capitalizes on the high infrared reflectance region and very low red region reflectance of deciduous foliage to create a high contrast between foliage and other materials. A specific combination of these high infrared and low red region reflectances excites the specific layers of the film to cause the artificial camouflage to react the same as foliage. The program establishes the allowable latitude in camouflage detection parameters, particularly red reflectance, infrared reflectance, infrared/red ratio, and the shape of the curve from the red to the infrared regions, plus optimum characteristics for matching various types of foliage. (Author)

AD-A029 561/9GA PC$4.00/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
Reconstruction of the Shape and Size of a Space Object.
Final rept.,
Mikiso Mizuki. 4 Feb 75, 33p SAMTEC-TR-75-161
Contract F04701-72-C-0203

Descriptors: *Space objects, *Image processing, *Photographic images, Photointerpretation, Numerical methods and procedures, Cylinders, Ellipsoids, Shape, Sizes(Dimensions).
Identifiers: Pattern recognition.

This technical report discusses the mathematical procedures developed for the reconstruction of a space object from measurements made on photographic images. Two shapes are considered. One is modified cylinder which has two hemispheres attached to the ends of a cylinder, and the other is a general ellipsoid. In the case of a modified cylinder, a simple solution exists under a stipulated condition. However, in the case of an ellipsoid, apparently no general solutions exist. A method of reconstruction can be obtained under a set of simplifying conditions. (Author)

AD-A029 648/0GA PC$5.50/MF$3.00
Aerospace Corp El Segundo Calif Chemistry and Physics Lab
TiO2 Thin Film: A New, Unconventional Photographic Material.
Interim rept.,
Paul D. Fleischauer, and H. K. Alan Kan. 10 Aug 76, 124p TR-0076(6270-20)-4, SAMSO-TR-76-188
Contract F04701-75-C-0076

Descriptors: *Photographic materials, Thin films, *Photographic film, *Photochemical reactions, Silver, *Titanium dioxide, Ions, Resolution, Ultraviolet radiation, Dyes, Electron beams, Halides, Information systems, Contrast.

An extensive research program concerning the photochemical reduction of silver ions on TiO2 surfaces has led to the development of a new high-resolution, moderate-speed unconventional photographic film. Image formation can be initiated by absorption of either near uv light (TiO2) or of visible light in adsorbed dye sensitizers. Primary images can be developed by means of a high-gain physical development process to produce continuous-tone images that can be read either optically or with an electron beam. (Author)

PATENT-3 963 490 Not available NTIS
Department of the Air Force Washington D C
Dye Sensitized Dichromated Gelatin Holographic Material.
Patent,
Andrejs Graube. Filed 25 Sep 74, patented 15 Jun 76, 3p AD-D002 847/2, PAT-APPL-509 201 Supersedes AD-D000 356.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Holography, *Gelatins, *Dyes, *Patents, Chromates, Sensitizing, Absorption, Visible spectra, Near infrared radiation, Recording systems.
Identifiers: PAT-CL-96-27.

The addition of a dye to a dichromated gelatin system extends the spectral sensitivity of the system throughout the visible and near infrared spectral regions. The dyes found to be effective as the sensitizer additive are those from the thiazine and triphenylmethane chemical families. The dye sensitized dichromated gelatin of this invention is capable of producing permanent, thick, phase holograms of high diffraction efficiency, good optical quality, and large refractive index change in the red spectral region.

15. MILITARY SCIENCES

15C. Defense

AD-A029 260/7GA PC$10.00/MF$3.00
System Development Corp Santa Monica Calif
Direction and Control Communications to Support Crisis Relocation Planning.
Final rept.,
Murray Rosenthal, and Leonard Farr. 30 Jun 76, 334p Rept no. SDC-TM-5572/003/01
Contract DCPA01-74-C-0284

Descriptors: *Civil defense, *Telecommunication, *Relocation, Control, Emergencies, Disasters, Management Planning and Control.
Identifiers: Emergency preparedness planning.

The final report of a project to plan for direction and control communications to support Crisis Relocation Planning (CRP). The report includes (1) a review of the literature related to CRP, operational communications, and DCPA guidance for communications planning; (2) formulation of communications requirements for CRP; (3) development and testing of prototype communications plans for a selected risk area (Colorado Springs-El Paso County), host area, (Fremont County, and state (Colorado); and (4) preparation of planning guidance for CRP direction and control communications, which can be applied to risk and host areas and to states throughout the nation. Included as appendices to the research report are the required prototype plans and planning guide.

AD-A029 525/3GA PC$9.25/MF$3.00
Systan Inc Los Altos Calif
Impacts of the Crisis Relocation Strategy on Transportation Systems. Volume I. Analysis and Case Study.
Final rept.,
John W. Billheimer, Robert Bullemer, Arthur Simpson, and Robert Wood. Aug 76, 277p Rept no. SYSTAN-D143-Vol-1
Contract DCPA01-75-C-0263
See also Volume 2, AD-A029 526.

Descriptors: *Relocation, *Population, *Land transportation, *Nuclear warfare, *Evacuation, Strategy, Emergencies, Civil defense, Transportation, Vehicles, Networks, Roads, Fuels, Cargo, Urban planning, Urban areas, State government, United States government, Colorado, Passenger vehicles, Cargo vehicles, Survival(Personnel).
Identifiers: Colorado Springs, Local government, Emergency planning.

This study investigates alternative strategies for transporting people and critical commodities from areas of high risk in anticipation of a nuclear attack; develops prototype plans for the continued operation of the transportation system under conditions of crisis relocation; and formulates planning guidelines designed to enable local officials to plan the effective use of

the transportation system in their jurisdiction under crisis conditions. The study addresses three principal components of the transportation system: vehicles; networks; and fuel. In each instance, the current status of the system is surveyed, crisis relocation requirements are estimated; potential bottlenecks are identified; and alternative courses of action are proposed and evaluated. General investigations of vehicle capabilities, network capacity, and fuel availability are undertaken at a nationwide level. More specific questions regarding the regional and local impacts of the crisis relocation strategy are addressed through a detailed investigation of the study area of Colorado Springs, Colorado. On the basis of the Colorado Springs case study, prototype crisis relocation plans have been developed identifying transportation measures appropriate for the State of Colorado, the Colorado Springs area, and a representative reception area, Fremont County, Colorado. Guidelines are presented that will enable local officials to develop similar plans for other risk areas.

AD-A029 526/1GA PC$6.00/MF$3.00
Systan Inc Los Altos Calif
Impacts of the Crisis Relocation Strategy on Transportation Systems. Volume II. Planning Guidelines.
Final rept.,
John W. Billheimer, Robert Bullemer, Arthur Simpson, and Robert Wood. Aug 76, 132p Rept no. SYSTAN-D143-Vol-2
Contract DCPA01-75-C-0263
See also Volume 1, AD-A029 525.

Descriptors: *Relocation, *Population, *Land transportation, *Nuclear warfare, *Evacuation, Strategy, Emergencies, Civil defense, Transportation, Vehicles, Networks, Roads, Fuels, Cargo, Passenger vehicles, Cargo vehicles, Urban planning, Urban areas, Mass transportation, Survival(Personnel), Colorado.
Identifiers: Local government, Emergency planning.

This section of the report is directed toward state and local officials charged with the task of developing crisis relocation plans for their jurisdictions. Guidelines are presented which will enable these officials to obtain the necessary data for planning and to formulate plans for the transport of people and critical cargo under crisis relocation conditions. These guidelines rely heavily upon existing data sources, contacts with transportation planners, freight haulers, Federal, state and local transportation agencies, and petroleum industry leaders, and a compendium of rules of thumb and distilled conventional wisdom assembled in past studies. It is intended that the guidelines should prove useful not only in crisis relocation planning, but also in monitoring the hazard state of the system during evacuation and in projecting future hazard states. (Author)

15D. Intelligence

AD-A029 252/4GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Standard Electronic Modules: Their Impact on Life-Cycle Cost Study.
Student study rept.,
John A. Wyatt. Nov 74, 74p
Report on Program Management Course.

Descriptors: *Modules(Electronics), *Standardization, *Life cycle costs, Electronic equipment, Reduction, Sonar equipment, Naval equipment, Systems management.
Identifiers: AN/BQQ-5, AN/BQQ-6.

The report examines the effectiveness of the Navy Standard Hardware Program in terms of its ability to bring about significant life-cycle cost reductions in electronic systems. It provides evidence of savings by analyzing results achieved in the development, production and logistic support of two modern sonar systems.

15E. Logistics

AD-A029 192/2GA PC$5.50/MF$3.00
Office of the Chief of Engineers (Army) Washington D C Engineer Studies Group
Study: Results and Use of Army Studies.
Final rept.,
Lyle G. Suprise. Aug 76, 124p

Descriptors: *Army research, *Army procurement, Quality assurance, Cost effectiveness, Contracts, Validation, Army planning.
Identifiers: Evaluation.

This study evaluates the results, uses, and benefits of a sample of Army studies completed or terminated during FY 74 and FY 75. The primary concern is with study evaluation, the extent to which individual studies achieve stated goals and objectives. Data were gathered from questionnaires completed by study sponsors and users and from examination of study documents. Included in the sample are studies in all The Army Study System (TASS) categories and by all means of accomplishment. Results are in the form of observations, conclusions, and recommendations related to resource levels, study achievements, use and nonuse, benefits, critical issues for study, and TASS. These results are intended to be used by top study management when taking actions or making decisions regarding funding levels, program focus, study undertakings, and improvements in study planning, programing, and execution to enhance chances of study success and usefulness.

AD-A029 255/7GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Design to Cost and Life Cycle Costing: Complementary or Dichotomous.
Student study rept.,
Warren Randolph McDonald. Nov 74, 60p
Report on Program Management Course.

Descriptors: *Military procurement, *Design to cost, *Life cycle costs, *Management planning and control, *Logistics management, Policies, Department of Defense, Air Force procurement, Air Force planning, Military requirements, Cost estimates, Research management, Air Force training, Military budgets.

The purpose of the study was to research two significant acquisition concepts, namely, design to cost and life cycle costing, to examine whether these concepts are complementary or dichotomous, and to isolate relevant implications for program managers.

AD-A029 271/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Shipboard Intermediate Range Combat System's (SIRCS) Implementation of COGP Recommendations.
Student study rept.,
Gerald L. Dunn. May 76, 49p
Report on Program Management Course.

Descriptors: *Naval procurement, *Weapon systems, *Shipboard, *Management planning and control, Policies, Department of Defense, Naval planning, Naval vessels, Naval logistics, Logistics management, Military requirements, Systems management, Acquisition.
Identifiers: SIRCS(Shipboard Intermediate Range Combat System), Shipboard intermediate range combat system.

The purpose of the report is to determine if the Shipboard Intermediate Range Combat Systems (SIRCS) is in consonance with the Commission of Government Procurement (COGP) Recommendations on Major System Acquisition. The COGP was chartered by Congress to determine what must be done to cure the numerous ills associated with the Federal Procurement Programs. The COGP presented their recommendations to Congress in December 1972. The newly established SIRCS Program was directed by the Secretary of the Navy to be the Navy's pilot program to implement the COGP Recommendations. The report is an in-depth study of both the COGP Recommendations on Major System Acquisition (12 Recommendations) and the SIRCS Program, its Background and Acquisition Strategy. The conclusion of the report is that the SIRCS Program is in consonance with the COGP Recommendations with two exceptions which are under the purview of Congress and the Secretary of Defense to implement.

AD-A029 274/8GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
The Dilemma of Uncertainties Associated with Cost Estimating in the Project Management Office.
Student study rept.,
Guy W. Davis. May 76, 42p
Report on Program Management Course.

Descriptors: *Army procurement, *Cost estimates, *Contract administration, *Management planning and control, Uncertainty, Cost analysis, Military planning, Contracts, Systems management, Department of Defense, Defense systems.

The purpose of the study was to investigate the dilemma of uncertainties associated with the cost estimating process in an Army Program Management Office during the systems acquisition process. In pursuing this objective, the study examines general approaches and purposes for preparing cost estimates and the problem areas which introduce uncertainties in the estimating process. The problems of primary concern were found to be in unforeseen program changes, inflation, inaccurate cost estimating, technical problems, and the lack of information. The report concludes with a discussion of various concepts being implemented to deal with uncertainties, and recommendations for improving estimating procedures in the project office.

AD-A029 275/5GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Army Night Vision Lead Laboratory Management.
Student study rept.,
Donald R. Kenney. Nov 74, 34p
Report on Program Management Course.

Descriptors: *Army procurement, *Night vision devices, *Laboratories, *Systems management, Joint military activities, Materiel, Military facilities, Military research, Research management, Defense systems, Acquisition, Army planning, Logistics management, Management planning and control.

The study examines the role of the Army Night Vision Laboratory (NVL) as the Lead Laboratory in support of selected systems acquisitions. The report presents a brief overview of NVL's mission, organization and resources. The focus of the report is limited to the lead laboratory concept and NVL's interface with other Army components and the Joint Services. Emphasis is placed on service and intraservice commonality programs.

AD-A029 276/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va

Material Acquisition Procedures of the U.S.S.R.
Student study rept.,
Kenneth A. Ingram. Nov 74, 32p
Report on Program Management Course.

Descriptors: *Military procurement, *USSR, *Government(Foreign), *Systems management, Policies, Defense systems, Production, Control, Communism, Weapon systems, Military planning, Management planning and control.

The purpose of this study is to examine the material acquisition procedures utilized by the government of the Soviet Union.

AD-A029 277/1GA PC$5.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
C/SCSC Implementation - Lessons Learned.
Student study rept.,
Leonard S. Marrella. May 75, 97p
Report on Program Management Course.

Descriptors: *Contract administration, *Management planning and control, *Logistics management, Cost estimates, Scheduling, Policies, Department of Defense, Military planning, Defense systems, Ammunition, Industrial plants, Military requirements, Contracts, Systems management, Cost analysis.
Identifiers: Lessons learned.

In the last eight years much time, energy, and money have been spent implementing the Cost/Schedule Control Systems Criteria (C/SCSC) on defense contractors and government facilities. Specifically, as of this date, there have been over 125 acceptable applications of C/SCSC by all three services on defense contractors and by the Army on some of its in-house labs and arsenals and Government-Owned Contractor Operated (GOCO) Ammunition Plants. Considerable experience has been accumulated and much has been learned during these last eight years. The purpose of this teaching paper was to fully document and synthesize all the relevant lessons learned from the comprehensive applications of C/SCSC. The paper specifically and separately addresses the implementation experiences with defense contractors, with inhouse labs/arsenals and with the Army's Ammunition Plants.

AD-A029 279/7GA PC$5.50/MF$3.00
Army Procurement Research Office Fort Lee Va
Analysis of the Make-or-Buy Decision Criteria for Commercial/Industrial-Type Activities.
Final rept.,
Frederick W. Helwig, Kimrey D. Newlin, and Monte G. Norton. Jul 76, 120p Rept no. APRO-518-F

Descriptors: *Army procurement, *Logistics management, Purchasing, Decision making, Policies, Department of Defense, Industries, Contracts, Materiel, Army planning, Systems management.

Consistent with the United States' free enterprise system, the stated policy of the Federal Government is to rely primarily on the private sector for its needed products and services. Although there is little disagreement with the policy, there is considerable controversy over the Government's implementation of its policy. Since the Government's make-or-buy decisions directly affect the jobs of contractor and Government personnel, representatives from both the private and public sectors are vocal in expressing their divergent views. A substantial sunk cost investment in Government-owned facilities and equipment as well as sociological and political considerations complicate the problem for Government decision makers. The objective of the study was to evaluate the laws, regulations, and general policy governing the Government's make-or-buy decision-making process to determine the appropriateness and effectiveness of current policies, practices, and implementing regulations; e.g., OMB Circular A-76 and AR 235-5.

AD-A029 310/0GA PC$10.50/MF$3.00
Air Force Systems Command Washington D C
Air Force Systems Command Research Planning Guide (Research Objectives).
1 May 76, 353p Rept no. AFSC-TR-76-01
Supersedes Rept. no. AFSC-TR-75-01 dated 1 May 75, AD-A016 930.

Descriptors: *Air Force planning, *Technology, Guides, Human resources, Environments, Aerospace systems, Propulsion systems, Electric power, Weapon systems, Electronic equipment, Air Force research, Manuals, Geophysics, Environmental protection, Human factors engineering, Materials.
Identifiers: Objectives.

The purpose of the Air Force Systems Command Research Planning Guide (Research Objectives) is to identify research needed by the Air Force. The document provides a method of informing military and civilian research and development communities of mid-term requirements to fill technological gaps associated with real and conceptual systems and of long-term requirements directed toward scientific opportunities which offer the greatest potential for impacting on future military operations. These requirements are stated as research objectives grouped into seven technical areas: (1) Human Resources/Life Sciences, (2) Materials, (3) Geophysics, (4) Aerospace Vehicles, (5) Propulsion and Power, (6) Weaponry, and (7) Electronics. Each technical area is divided into subareas which are categories of research objectives within the technical area. Each subarea presentation contains a short description of its scope, the mid-term requirements, the long-term requirements and listing of points of contact. If possible, mid-term requirements are correlated with research needs stated in Technology Planning Objectives defined by each Laboratory and Technology Needs submitted to the Laboratories by AFSC organizations. Long-term requirements are based on Air Force scientists knowledge and evaluation of the scientific areas of greatest activity and potential.

AD-A029 311/5GA PC$3.50/MF$3.00
Army Test and Evaluation Command Aberdeen Proving Ground Md
U. S. Army Test and Evaluation Command Development Test II - Common Test Operations Procedures, 'Rain and Freezing Rain'.
Final rept.
19 Jun 75, 11p Rept no. TOP-2-2-815
Supersedes Rept. no. MTP-2-2-815 dated 8 Dec 70, AD-718 745.

Descriptors: *Rain erosion, *Army equipment, Raindrops, Erosion, Rain, Hail, Splash, Freezing, Simulation, Test facilities, Fuzes(Ordnance), Clothing, Small arms, High velocity, Impact tests, Aircraft equipment, Military vehicles.
Identifiers: Freezing rain.

This test provides a method of evaluating the effects of rain, hail, splash, and freezing rain on Army equipment. It includes simulated free-falling and blowing rain and high-velocity impacts with raindrops and describes test facilities. It applies to vehicles, equipment, ammunition, small arms, and clothing. It is not applicable to large missiles and rockets; to snow, sleet, high humidity, mud, submerging, and swimming; or to slippage of tires on wet roads.

AD-A029 321/7GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Approaches to Solving GFE Dilemmas in Navy Shipbuilding Contracts.
Study project rept.,
Joseph J. Pinelli. May 76, 28p

Descriptors: *Military equipment, *Shipbuilding, *Logistics management, Management planning and control, Logistics support, Contracts, Scheduling, Costs, Naval procurement, Effectiveness, Assessment.
Identifiers: *Government furnished equipment, GFE(Government furnished equipment).

Government-furnished equipments (GFE) are the cause of many cost and schedule problems experienced by the military program managers. This study addresses some of the typical problems encountered in the past by Navy program managers and offers some approaches which show promise of eliminating or reducing these problems. The study addresses why GFE is used; the obligation of the government when GFE is used; the ASPR policy in regards to GFE; problems associated with responsibility and authority when GFE is procured by functional managers in a matrix organization; recent recognition by OSD of the GFE problem; and offers some approaches which show promise to eliminate or reduce the problems associated with GFE. While the study concentrated on problems encountered by the Navy in shipbuilding programs as the source, many of these same problems are commonly experienced by military program managers of all the services, and the proposed approaches which may reduce these problems have application in programs other than Navy shipbuilding. (Author)

AD-A029 322/5GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
ECP Processing Delays in a Joint Service Project.
Study project rept.,
Richard W. Platt, Jr. May 76, 52p

Descriptors: *Management engineering, *Data processing, *Management information systems, *Value engineering, Time, Configurations, Joint military activities, Delay.
Identifiers: *Engineering change proposals, *Configuration management, Project management.

The purpose of this study was to investigate delays in the processing of ECP's in a particular multi-Service commodity oriented project. The investigation covers that phase in the processing of an ECP from the receipt of the proposal by the Government to the approval/disapproval decision by the Configuration Control Board Chairman. The system that was studied has the following characteristics which make it somewhat unique: (1) there are seven Configuration Control Boards within the Project, (2) each Configuration Control Board has members from each of the four Services, (3) each Configuration Control Board processes ECP's for more than one end item, and (4) the Configuration Control Board members do not convene to a central location for meetings. Research for the study consisted of a review of the applicable regulations, an analysis of data on the time necessary to complete major tasks in the ECP evaluation process, and interviews with individuals involved in the processing of ECP's. Recommendations contained in the report are to: (1) establish realistic processing targets for each major processing step, (2) expedite the implementation of a Configuration Status Accounting System, (3) eliminate unecessary board members, and (4) forward ECP information directly to the individuals who must evaluate that information.

AD-A029 330/8GA PC$6.75/MF$3.00
Army Armament Command Rock Island Ill Cost Analysis Div

Ammunition Cost Research Study.
Technical rept.,
Gerald W. Kalal, and Patrick J. Gannon. Jun 76, 175p Rept no. DRSAR-CPE-76-4
Errata sheet inserted.

Descriptors: *Army procurement, *Ammunition, *Cost estimates, Cost models, Ammunition components, Automatic weapons, Guns, Tanks(Combat vehicles), Investment expenditures, Production engineering, Industrial plants, Military facilities, Army planning.

At the complete round level of detail, statistically valid cost estimating tools for independent parametric cost estimates of ammunition investment costs have been difficult to construct. The long life span of ammunition items reduces the number and range of data points available for a given weapon system class (e.g., tank main-armament). To counter this problem, a research project has been undertaken to develop cost estimating tools for ammunition components. This report demonstrates how component-level cost models can be used to independently estimate medium-bore automatic cannon and tank main-armament ammunition investment costs with greater statistical validity than has been obtained with past approaches. The investment cost models cover ammunition initial production facilities (IPF) and procurement.

AD-A029 338/1GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Repair Parts Support for Commercial and Commercial Modified Engineer Construction Equipment.
Study project rept.,
Clemens S. Gailliot, Jr. May 76, 37p

Descriptors: *Spare parts, *Army procurement, Logistics support, Commercial equipment, Construction equipment, Military engineering, Logistics planning, Cost benefits, Policies, Methodology, Cost effectiveness.

The purpose of this study report was to review and evaluate the impact of repair parts provisioning and supply procedures on cost, ordership-time and equipment readiness for engineer construction equipment. Emphasis was placed on cataloging cost associated with initial provisioning and the logistic support procedures currently used by the army to provide repair parts at the retail level, i.e., the organizational, direct and general support and depot levels for CONUS and OCONUS activities. The study results indicate that readiness considerations are the primary determinants of the current policies, that the current support policies are most compatible with the support requirements of military designed equipment and that significant cost savings could be realized by capitalizing on the existing manufacturers supply and support systems. Recommendations are made for possible approaches to providing improved support at reduced costs through greater use of commercial supply procedures, publications and sources. (Author)

AD-A029 339/9GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
An Overview of R and D in the Marine Corps Systems Acquisition Process.
Study project rept.,
Jan H. Van Gorder. Nov 74, 43p

Descriptors: *Naval research, *Marine Corps, Missions, Military organizations, Research management, Logistics planning, Amphibious operations, Command and control systems, Naval procurement.
Identifiers: Research and development.

The purpose of this study is to provide an overview of the U.S. Marine Corps' involvement in research and development to interested parties in government and industry. Recognizing that the Marine Corps retains a peculiar and little understood position in the organization of the Department of Defense, the un-informed reader can be expected to have several unanswered whys, hows, and whens concerning this involvement. This study condenses and distills information from several sources to answer the most prominent of these questions. The study identifies the statutory and organizational authorities and responsibilities that are assigned to the Marine Corps in the research and development area. The internal organization for research and development within the Marine Corps is briefly discussed and related to primary elements within the Department of the Navy research and development structure. The objective of the Marine Corps research and development effort and the general and specific policies are described. The materiel needs documentation process is explained by defining document purpose and tracing formulation procedure. The generally accepted development cycle is not iterated, but the three methods by which the Marine Corps pursues participation in the development and acquisition of materiel are discussed. (Author)

AD-A029 361/3GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Leadtime Away Procurement of Modification Kits. Executive Summary.
Study rept.,
Ronald J. Meyette. Nov 74, 32p

Descriptors: *Air Force procurement, *Modification kits, Lead time, Supply depots, Logistics support, Policies, Military requirements, Contracts, Military aircraft, Installation, Naval procurement, Army procurement, Comparison.
Identifiers: *Leadtime away procurement.

The 'leadtime away' policy for procurement of depot level modification kits restricts the services from buying modification kits in the current year if they can not install them in the following year. This policy is not formally defined in DoD or service headquarter directives or regulations. However, the leadtime away policy has been implemented informally. This policy will be formalized by the Air Force in the future with the issuance of a revision to AFR 57-4 and a new AFR 400XX. The purpose of this policy is to prevent the early delivery of modification kits while awaiting the input of aircraft into a two (2) to five (5) year depot cycle. Several buys of kits may be required to support this policy, increasing costs 25 to 30% over one or two buys. As a result, there is currently some question as to the necessity for such a policy. This report provides background information on the leadtime away concept in the three services. The advantages and disadvantages of leadtime away procurements are discussed. It is concluded that more innovative contracting methods should be found to minimize procurement costs. In addition, more data and further studies are required to quantify any cost advantages of the leadtime away concept. (Author)

AD-A029 483/5GA PC$5.00/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md
Navy Technical Manual System (NTMS) Implementation of Program Development Plan during FY 75.
Final rept. 1 Jul 74-1 Jan 75,
Joseph J. Fuller, and Robert A. Sulit. Jan 75, 92p Rept no. DTNSRDC-4613

Descriptors: *Naval planning, *Logistics support, *Manuals, *Information systems, *Military publications, *Data processing, *Computer programs, Specifications, Human factors engineering, Data reduction.
Identifiers: *Technical manuals, Engineering data, Military specification, Naval technical manual system, Automatic data processing, NTMS(Naval Technical Manual System), Measures of effectiveness, Management science.

This report provides a detailed description of the FY 75 program and planned FY 76 program for the formulation and development of the Navy Technical Manual System (NTMS). The portion of the NTMS development program carried out during FY 75 is divided into four parts: concept formulation phase of system development; tests and experiments; technology development and evaluation; and management support. The NTMS Development Program Definition (Phase 0 of System Development Part) has been completed. Concept Formulation (Phase I) is currently underway with the analysis of current/proposed TM systems. In the tests and experiments part, the Simplified Maintenance Manual Design Test is in Phase B, namely, the Production of the AN/APQ-126 Work Package TM. SMMD is a three-phase program schedule for completion in November 1975. The following technology development and evaluation tasks have been initiated: Transformation of Engineering Data into TM Material (Ship Systems), Transformation of Engineering Data into TM Material (Aircraft Systems), Format/Media Technology Assessment, Assessment of TM Comprehensibility, Personnel Characteristics Definition, and TM Effectiveness Measurement Through User Performance. Within the management support part, the solicitation process for obtaining a Prime Contractor to develop NTMS is underway. (Author)

AD-A029 572/5GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Financial Control of Air Force Weapon System Acquisition Funds Following Appropriation.
Student study rept.,
Frederick H. Leich. May 75, 71p
Report on Program Management Course.

Descriptors: *Air Force procurement, *Weapon systems, *Finance, *Management planning and control, Department of Defense, Policies, Air Force budgets, Accounting, Research management, Management engineering, Logistics management, Air Force planning, Planning programming budgeting.

It was the goal of the author to understand how Air Force Weapon Systems Acquisition Funds are controlled after Appropriation and to explain the process. The paper will reveal the findings of a limited research into the area of Acquisition Funds Management but should give interested personnel a greater understanding of the Acquisition Funds Management process as it exists today in the Air Force.

AD-A029 573/3GA PC$4.50/MF$3.00
Defense Systems Management School Fort Belvoir Va
Future of Integrated Logistics Support in Air Force Test and Evaluation at AFFTC.
Student study rept.,
William E. Krebs. May 75, 71p
Report on Program Management Course.

Descriptors: *Air Force facilities, *Research management, *Logistics support, *Air Force procurement, Management engineering, Flight testing, Jet fighters, Test methods, Department of Defense, Policies, Air Force planning, Management planning and control, Logistics management.

The purpose of the study was to analyze the current management concept of Integrated Logistics Support in the Test and Evaluation en-

vironment at the Air Force Flight Test Center. To measure strengths and weaknesses of a proposed ILS Management Plan in comparison to the present mode of operation. The primary method of research was through personal and telephone interviews with ILS managers at HQAFLC/AQ, F-15 DPML, Wright Patterson AFB, and the Air Force Flight Test Center. DOD Directives and current Air Force Regulations and Test Plans were also extensively utilized. The report concludes that the new approach is a good one and will enable AFLC to better utilize its resources in integrating all test programs of concern to HQAFLC.

AD-A029 678/0GA PC$5.00/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Relationship between the G-2 and the G-3.
Final rept.,
Allen F. Rossow. 11 Jun 76, 82p
Master's thesis.

Descriptors: *Officer personnel, *Job analysis, *Military intelligence, *Army operations, Personnel management, Army personnel, Military Forces(United States), Military Forces(Foreign), Combat readiness, Military doctrine, Systems analysis, Theses, Army planning.
Identifiers: Span of control.

Currently the U.S. Army is intensely appraising its doctrine and methods in view of perceived future wars. The relationship existing between the division G-2 and G-3 has not been examined. Historically in peacetime the role of the G-2 and related intelligence resources have been drastically reduced. This capability then had to be redeveloped on a crises basis with less than full effectiveness to join tactical forces in the conflict. This study first examines the history and basis for the coordinating staff principals. Through interviews, current relationships in foreign and U.S. Army staffs and the functional responsibilities of the G-2 and G-3 are examined. Interviews then provide an examination of divisions today and how resources are allocated between the intelligence and operations fields/staffs.

PB-256 477/1GA PC$5.00/MF$3.00
De Vany (Arthur)/Saving (Thomas R.), College Station, Tex.
Truck Transportation Efficiency.
Final rept.,
Arthur De Vany, and Thomas R. Saving. 30 Jun 75, 99p MVMA-ASD/TRS-75-15
Contract ASD/TRS 750-C6.12

Descriptors: *Cargo transportation, *Highway transportation, *Trucks, *Queueing theory, Transportation models, Economic analysis, Demand(Economics), Prices, Mathematical models.

The relationship among uncertainty, excess capacity and quality of service in the truck transport industry is studied through the use of queueing theory. The shipper's demand for trucking is characterized and the competitive equilibrium price, capacity and output is obtained. The impact of regulation is studied and it is shown that regulation which compresses rates across time, distance and market densities causes an uneven distribution of service quality.

15F. Nuclear Warfare

AD-A029 365/4GA PC$4.00/MF$3.00
Defense Systems Management School Fort Belvoir Va
Nuclear Survivability for Army Tactical Equipment - an Approach to Defining the Benefits.
Study project rept.,
Marth H. Christensen. May 76, 41p

Descriptors: *Nuclear explosion damage, *Radio equipment, *Survival(General), *Army personnel, *Survival(Personnel), Nuclear warfare, Nuclear radiation protection, Radiation hardening, Radiation damage, Radiation effects, Yield(Nuclear explosions), Epicenters, Range(Distance), Vulnerability, Army equipment, Frequency modulation, Brigade level organizations, Forward areas, Cost benefits, Cost estimates.

Nuclear survivability is and will continue to be a design requirement for many new Army tactical systems progressing through the new materiel development process. The purpose of this study is to suggest an approach to getting a handle on exactly what it is that nuclear survivability buys for the Army so that rational cost/benefit decisions can be made. A conceptual approach is proposed which includes defining the survivability alternatives, selecting or developing a nuclear scenario, exercising the scenario using good weapons effects and vulnerability data, comparing results using appropriate measures of effectiveness, evaluating the sensitivity of the results to assumptions, and applying the results in conjunction with cost and other factors. An example application of this approach to a benefit analysis of three fictitious survivability alternatives of the Army's FM field radios is demonstrated. The approach presented represents a beginning in cost/benefit field which has received little attention. (Author)

15G. Operations, Strategy, and Tactics

AD-A029 137/7GA PC$4.50/MF$3.00
Decisions and Designs Inc Mclean Va
The Timeliness of a NATO Response to an Impending Warsaw Pact Attack.
Technical rept.,
Rex V. Brown, Clinton W. Kelly, III, Richard R. Stewart, and Jacob W. Ulvila. Dec 75, 68p Rept no. DT/TR-75-7
Contract N00014-76-C-0074, ARPA Order-3052

Descriptors: *NATO, *Warsaw Pact countries, War games, Political science, Decision making, Tension, Mobilization, Readiness, Military planning.
Identifiers: Military force posture.

This study focuses on an assessment of NATO readiness in the event of a Warsaw Pact attack. The purpose of the study was to develop a methodology for understanding the NATO decision-making process during periods of rising tensions involving the increasingly strong possibility of an attack by the Warsaw Pact countries. The particular question addressed by the study was--if the Warsaw Pact were to attack at the end of a 30-day mobilization cycle, at what point in time after the Pact begins to mobilize would NATO initiate a state of reinforced alert. An answer to this question can serve as an input for determining the most likely state of NATO readiness on Warsaw Pact D-day. Obviously, there may be as many answers to questions about NATO reaction time as there are experts with plausible scenarios. However, since there is no one set of correct answers, the development of new techniques and insights to assist military planners in making more realistic, defensible estimates of NATO mobilization time is perceived to be of considerable value with respect to U.S. General Purpose Force Planning and in Mutual and Balanced Force Reduction (MBFR) negotiations.

AD-A029 171/6GA PC$4.50/MF$3.00
Quest Research Corp Mclean Va
Research on 'SMART TARGET' for Aerial Combat. Part 1. General Description.
Final rept.
Aug 76, 69p AMRL-TR-75-82
Contract F33615-74-C-4053
See also Part 2, AD-A029 172.

Descriptors: *Aerial warfare, *Digital simulation, *Aerial targets, *Flight simulators, Air to air, Computerized simulation, Flight simulation, Computer programs, Airplane models, Jet fighters, Man machine systems, Response, Maneuverability.
Identifiers: *Smart targets, F-4E aircraft, F-4J aircraft, *Responsive targets, Dynamic environment simulator, Man in the loop.

The object of this research effort was to provide a responsive target for air combat simulation on the Dynamic Environment Simulator located at Aerospace Medical Research Laboratory. Accomplishment of this effort required review of alternative aerial combat maneuvering models to establish an acceptable technical approach for the Smart Target tactics model. An aircraft model was then developed, using dynamics representative of an F-4E or J aircraft from aerodynamic tables. The models were incorporated in a computer program that will be implemented by AMRL. (Author)

AD-A029 172/4GA PC$6.00/MF$3.00
Quest Research Corp Mclean Va
Research on 'SMART TARGET' for Aerial Combat. Part 2. Technical Description.
Final rept.,
James Kuhns. Aug 76, 145p AMRL-TR-75-83
Contract F33615-74-C-4053
See also Part 3, AD-A029 173.

Descriptors: *Aerial warfare, *Digital simulation, *Aerial targets, *Flight simulators, *Computer programs, Air to air, Computerized simulation, Flight simulation, Airplane models, Jet fighters, Man machine systems, Response, Maneuverability.
Identifiers: *Smart targets, *Responsive targets, F-4E aircraft, F-4J aircraft, Dynamic environment simulator, Man in the loop.

This document contains the technical description of the 'SMART TARGET' program which is part of an air-to-air combat simulator implemented on the Dynamic Environmental Simulator located at Aerospace Medical Research Laboratory. This document, when used in conjunction with machine listings of the software, provides the technical information which a competent programmer/analyst requires to use, correct and/or modify the software described. Part 1 of this report describes in detail the tactical model employed within this program. (Author)

AD-A029 173/2GA PC$3.50/MF$3.00
Quest Research Corp Mclean Va
Research on 'SMART TARGET' for Aerial Combat. Part 3. Interface Documentation.
Final rept.,
James Kuhns. Aug 76, 16p AMRL-TR-75-84
Contract F33615-74-C-4053
See also Part 1, AD-A029 171.

Descriptors: *Aerial warfare, *Digital simulation, *Aerial targets, *Flight simulators, *Computer programs, Air to air, Computerized simulation, Flight simulation, Airplane models, Jet fighters, Man machine systems, Response, Maneuverability, Man computer interface.
Identifiers: *Smart targets, *Responsive targets, F-4E aircraft, F-4J aircraft, Dynamic environment simulator, Man in the loop.

Three functions must be interfaced with the responsive target computer program for this target to operate in real time. First the program must be tied to a real clock. The integration interval employed in the program is 0.1 second, thus a 0.1-second clock rate must be provided to the system. Second, the position, velocity, and attitude information concerning the state of the opponent must be provided to the program. The information will be obtained from

analog voltages ranging from -10 to 10 volts that will be read into the Pacer 100 by an analog to digital converter. Third, the position and attitude of the target must be presented to the pilot in the opponent aircraft. These variables will also be provided as analog voltages and require a digital to analog conversion step. (Author)

AD-A029 217/7GA PC$6.75/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
Corps Rear Area Security: Analysis of Threat, Doctrine, and Force Options.
Final rept.,
Edward B. Bryson. 11 Jun 76, 171p
Master's thesis.

Descriptors: *Area security, *Cavalry, *Military police, *Military reserves, Military doctrine, USSR, Warsaw Pact countries, Guerrilla warfare, Europe, Theses.
Identifiers: Rear areas, Midintensity warfare, Armored cavalry, Reserve forces.

This study investigates Rear Area Security for a Corps in Europe in a mid-intensity war. The investigation includes the threat of the Soviet and Warsaw Pact Armies; current U.S. Army doctrine for Rear Area Security; and analysis of the geographic and organizational aspects of the Corps rear area; and an analysis of the mission, organization and training, and command and control capabilities of the Armored Cavalry Regiment, the Corps reserve force, and the military police brigade. The primary focus of the investigation is to determine what force is best suited for Corps rear area security. Investigation records that Soviet and Warsaw Pact Armies have developed substantial forces and doctrine to employ guerrilla and conventional forces against targets in the Corps rear area. The conventional threat includes air assault, airborne, and air landed forces supported by tactical air. Current U.S. doctrine employing combat service support forces is not a practical defense. Federal Republic of Germany Territorial forces are not generally employed forward of the Corps rear boundry.

AD-A029 227/6GA PC$5.50/MF$3.00
Center for Naval Analyses Arlington Va
The Gorshkov Articles, the New Gorshkov Book and Their Relation to Policy,
James M. McConnell. Jul 76, 104p Rept no. CNA-Professional paper-159

Descriptors: *Military doctrine, *Naval operations, *USSR, Military forces(Foreign), Missions, Policies, Ballistic missile submarines, Nuclear powered submarines, Antisubmarine warfare, Military strategy, Underwater to surface missiles, Nuclear warfare, History, Deployment.

The Gorshkov referred to is Admiral of the Fleet of the Soviet Union Sergey Gorshkov, Commander-in-Chief of the Russian Navy. The debate among Western Analysts, now over three years old, is about a series of articles which he published, under the title of 'Navies in War and Peace,' in his Navy's monthly journal, The Naval Digest, over the course of 1972-73. It was originally intended in this paper to present a summary of 'the state of the debate; dealing with the arguments of all the participants. This plan was changed by the publication, in February of this year, of a book by Gorshkov, entitled The Sea Power of the State. The theme is the same as the series, and much of the data is only repetition, but here and there a point that is only adumbrated in the series (e.g., command of the sea) is expanded into an entire section, and even when the book only supplements the series, it often firms up what could previously only be inferred. There are two questions that have been central to the debate from the very beginning: the question of the authoritativeness of the Gorshkov series--is he advocating or announcing--and the question of its content.

AD-A029 460/3GA PC$6.75/MF$3.00
Army Command and General Staff Coll Fort Leavenworth Kans
The Evolution of French Army Doctrine, 1919-1939.
Final rept.,
Robert A. Doughty. 11 Jun 76, 162p
Master's thesis.

Descriptors: *Military doctrine, *Military forces(Foreign), *France, Government(Foreign), Theses, National defense, Military operations, History, Warfare, Military planning.

The thesis examines French military operations, warfare and history of the years 1919-1939.

16. MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-A029 237/5GA PC$6.75/MF$3.00
Air Force Eastern Test Range Patrick AFB Fla
The United States Air Force Eastern Test Range. Range Instrumentation Handbook.
Final rept.,
Bruce E. Cone. 1 Jul 76, 175p Rept no. AFETR-TR-76-04
Supersedes Rept. no. AFETR-TR-71-5 dated Sep 71, AD-735 263.

Descriptors: *Guided missile ranges, *Instrumentation, Ground support equipment, Data processing, Guided missile tracking systems, Telemeter systems, Command and control systems, Communication and radio systems, Data transmission systems, Guided missile safety, Impact prediction, Handbooks, Radar, Optics, Ships.
Identifiers: Air Force Eastern Test Range.

The Air Force Eastern Test Range (AFETR) extends from the eastern United States mainland through the south Atlantic Ocean area eastward into the Indian Ocean. It includes all stations, sites, ocean areas, and air space necessary to conduct missile and space vehicle test and development. This handbook describes the major instrumentation systems now operating, or being installed, on the ETR. The equipment and operation of each system is discussed briefly, and its location and accuracies given. (Author)

16B. Missile Trajectories

AD-A029 568/3GA PC$3.50/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
Utilization of 'a priori' Estimates in ICBM Trajectory Determination.
Final rept.,
Russell E. Roy. 11 Mar 76, 19p SAMTEC-TR-76-77
Contract F04701-72-C-0203

Descriptors: *Guided missile trajectories, Estimates, Guided missile ranges, *Guided missile tracking systems, Solutions(General), Matrices(Mathematics), Computer programs, Errors.

There are two particular linear estimation techniques frequently used by various agencies and test ranges to derive ICBM trajectory coordinates from both test range tracker measurements and 'a priori' estimates of parameters pertinent to accurate trajectory solutions. Whenever each of the techniques is applied to the same set of tracker measurements and 'a priori' estimates, significantly different trajectory solutions and solution uncertainties are obtained. This disturbing fact has motivated an analysis and comparison of the techniques that are of major interest in this report. An expository account of the techniques that consists of development, description, and discussion of their basic structures is presented. The material is intended to provide information or knowledge that can be of use when either of the techniques is a candidate for trajectory estimation problems, and to reveal pertinent rationale that accompany solutions derived from each technique. (Author)

16C. Missile Warheads and Fuses

AD-A029 166/6GA PC$3.50/MF$3.00
Aerospace Corp El Segundo Calif Materials Sciences Lab
Impact Damage Mechanisms of 3-D Carbon-Carbon Material.
Final rept. 1 Jul-31 Aug 75,
Louis Rubin. 23 Jul 76, 24p TR-0076(6550-77)-2, SAMSO-TR-76-142
Contract F04701-75-C-0076

Descriptors: *Carbon carbon composites, Erosion, Erosion resistance, *Nose tips, Hydrometeors, Impact, Damage, Three dimensional, Cratering, Buckling, Flexural properties, Microstructure, Carbon fibers, Orientation(Direction).

Impact-induced damage mechanisms for GE 2-2-3 Carbon-Carbon have been identified for both axial and transverse fiber bundles, and changes in the nature and severity of damage have been observed as a function of location with respect to the impact crater geometry. Although axial fiber bundles exhibited column buckling failure when immediately beneath an impact crater, they were relatively intact (except for tensile cracks in some individual fibers) at positions alongside or away from the major craters. Transverse fiber bundles, however, showed column buckling failure in locations alongside or between craters, while only flexural-type failures were noted in locations directly below a crater. (Author)

AD-A029 545/1GA PC$7.50/MF$3.00
Calspan Corp Buffalo N Y
Studies of Transitional Flow, Unsteady Separation Phenomena and Particle Induced Augmentation Heating on Ablated Nose Tips.
Final rept. Nov 74-Jun 75,
Michael S. Holden. Oct 75, 198p CALSPAN-AB-5646-A-1, AFOSR-TR-76-1066
Contract F44620-75-C-0019

Descriptors: *Nose tips, *Aerodynamic heating, *Ablation, Boundary layer transition, Particles, Blunt bodies, Roughness, Hypersonic flow, Shock waves, Interactions, Laminar boundary layer, Turbulent boundary layer, Mach number, Reynolds number, Stagnation point, Pressure gradients, Separation.
Identifiers: Separated flow, Unsteady flow.

This report describes the results of two distinct studies of the aerodynamic heating of nose tips. In Part 1 the development of laminar, transitional and turbulent boundary layers over ablated nose shapes at Mach numbers from 8 to 13 for Reynolds numbers up to 80x10 to the 6th power based on model diameter were studied experimentally. Two groups of models were employed in this study; blunt elliptic, blunt biconic and triconic models were used in the first phase of this investigation where the greatest emphasis was placed on examining the length and structure of the transition region and the parameters which influence it. The second phase of this study was devoted to ex-

amining the flow over 'highly ablated' nose shapes, over which flow separation and gross flow instabilities occurred. The influence of nose tip configuration, roughness and model incidence, as well as the Mach number and Reynolds number of the free stream on the occurrence and structure of large scale periodic instabilities was studied. These studies demonstrated the strong effect of pressure gradient and roughness on the length and characteristics of the transition region. In turn these parameters, along with nose tip geometry, strongly influence the occurrence of flow instabilities over highly-indented nose shapes. In Part 2 of this investigation, the generation of disturbances in the stagnation region of the flow as a particle, (which comes from the model surface), interacts with the bow shock was studied in detail.

16D. Missiles

AD-A029 645/9GA PC$3.50/MF$3.00
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Physical Sciences Directorate
Optical Measurement of Missile Wing Deformation in High Velocity Tests.
Technical rept.,
Charles R. Christensen, J. Lynn Smith, Terry A. Martin, and Judson R. Griffin. 19 Jul 76, 21p
Rept no. RR-7T-1
Presented at the Army Science Conference, 22-25 Jun 76, West Point, N. Y.

Descriptors: *Wings, *Surface to air missiles, Deformation, Measurement, Guided missile components, Test methods, Rocket sleds, Mirrors, Grids, Streak cameras, Photographic analysis, Feasibility studies, Mach number.
Identifiers: Hawk, Moire effects.

Two methods were developed to measure missile wing deformations during rocket sled tests. One technique uses a mirror polished test wing which reflects a grid pattern painted on one of the perpendicular wings. The test wing and grid are both moving at the same velocity and the reflection of the grid on the test wing can therefore be photographed with the sled test track streak cameras. The displacement of the grid reflection on the deformed wing from that of the undeformed wing determines the angular deformation. The spatial deformation is found by curve fitting from a point of zero deformation. The available streak camera resolution allowed angular deformations of approximately 0.2 degrees to be measured, corresponding to a linear spatial displacement of approximately 0.025 inch. This technique was used in Hawk missile tests conducted at the Holloman Air Force Base High Speed Track. Test wing profiles were calculated from streak camera photographs taken at velocities near Mach 2. A Moire analysis technique was also developed which requires ruling the wing with a grid pattern and photographing the ruled wing at two different angles both before and after deformation. Moire fringes formed by superimposing phototransparencies are used to measure displacements. A laboratory demonstration was conducted to demonstrate its feasibility. (Author)

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A029 190/6GA PC$6.00/MF$3.00
Naval Underwater Systems Center New London Conn New London Lab
A Shallow Water Acoustic Model for an Ocean Stratified in Range and Depth. Volume II,
William G. Kanabis. 30 Jun 76, 130p Rept no. NUSC-TR-4887-II
See also report dated 25 Mar 75, AD-A008 150.

Descriptors: *Sonar signals, *Shallow water, Acoustic velocity, Ray tracing, Mathematical models, Computer programming, Underwater sound, Continuous waves.

Volume 1 of this report discussed the shallow water acoustic model. The theoretical basis underlying the model and the implementation of the model through a computer program were described. Volume 2 will describe the present status of the validation procedure for the model. First comparisons with other models through the use of standard cases are described; second comparisons are made with actual data. The primary purpose of the comparisons with other models is to test the mathematics of the calculations employed in the model. The primary purpose of the comparisons with actual data is to test the physical assumptions inherent in the model.

AD-A029 519/6GA PC$3.50/MF$3.00
David Taylor Model Basin Washington D C
Predictions of Forces, Moments, Cavitation, and Separation from Tests on a Model of a 16-Foot Sonar Dome AN/BQR-2,
S. H. Brooks. 30 Aug 49, 14p Rept no. DTMB-C-254

Descriptors: *Sonar domes, Loads(Forces), Moments, Cavitation, Model tests, Marine engineering, Coefficients, Hydrodynamics.
Identifiers: AN/BQR-2.

Tests were conducted on Models 4139A and B representing a 16-foot sonar dome to determine the longitudinal, transverse, and vertical force coefficients, the effect of roll at a velocity of 10 feet per second on these coefficients, and to investigate cavitation on the dome.

PAT-APPL-458 927/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Suspension System for Directional Hydrophones.
Patent Application,
John R. Dale, William F. Brenner, James F. McEachem, Walter L. Lenpold, and Edward A. McDemus. Filed 1 Apr 74, 10p AD-D002 860/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Suspension devices, Hydrophones, Underwater sound equipment, Background noise, Vibration, Control.
Identifiers: *Patent applications, PAT-CL-340-4.

The patent application relates to a system for suspending a gradient hydrophone from a flotation member at the surface of a body of fluid by a single compliant member attached closely above the center of gravity of the hydrophone, in order to minimize the number of principal vibration modes, such as the rocking mode, and group the frequencies of such principal vibration modes in a band far enough below the operational acoustical bands of the hydrophone to allow effective electronic rolloff.

PAT-APPL-643 047/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Multi-Path Signal Enhancing Apparatus.
Patent Application,
Herman Medwin. Filed 22 Dec 75, 12p AD-D002 871/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Signal processing, Analog to digital converters, Fast Fourier transforms, Multichannel, Multipath transmission, Reception.
Identifiers: *Patent applications, PAT-CL-329-1, Signal detection.

The patent application relates to a plurality of processing channels each receiving one of a number of direct and secondary signal energy rays. Each channel includes an A/D converter and computer the logic of which is controlled by a Fast Fourier Transform (FFT) algorithm to produce a plurality of data outputs each containing the amplitude and phase information of selected frequencies present in the channel input. To enhance signal detection and minimize signal strength fluctuations, each of the selected frequency outputs of each channel FFT is compared with each identical frequency output of other channel FFT's. Phase compensation means such as a shift register adjusts the phase relationship between all identical FFT outputs to permit their amplitudes to be constructively added. The individual subtotals so produced are totalled to provide an output representing the combined strength of the multi-path signal energy. In particular, medium interfaces such as an air-sea or air-ground interface, produce wide variations in the incoming direction of the signal energy to be detected.

PATENT-3 954 015 Not available NTIS
Department of the Navy Washington D C
Method of Determining Piezoelectric Constants of Ceramic Rings.
Patent,
Joseph F. Zalesak, and Peter H. Rogers. Filed 17 Jul 75, patented 4 May 76, 6p AD-D002 895/1, PAT-APPL-596 871
Supersedes AD-D001 957.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Piezoelectric transducers, *Patents, Ceramic materials, Rings, Piezoelectricity, Measurement, Hydrophones, Sonar equipment.
Identifiers: PAT-CL-73-552, Cylindrical shells.

The patent relates to a method of ascertaining the piezoelectric constants (d sub 31,d sub 33,g sub 31,and g sub 33) of ceramic cylindrical shells (rings) used as the active elements in hydrophones and sound sources to insure quality control. These constants may be obtained by measuring the electrical capacitance of the ring and by measuring the omnidirectional free-field voltage sensitivity, the ratio of the axial and radial sensitivity at a higher frequency and the physical dimensions of the ring. Since the required frequencies are low and the ring is symmetric, the acoustical measurements can be made in a closed mechanically driven air chamber.

PATENT-3 961 304 Not available NTIS
Department of the Navy Washington D C
Decoupled Hydrophone with Reduced Response to Vibration and Stress Concentration.
Patent,
Henry P. Bakewell, Jr. Filed 21 Oct 74, patented 1 Jun 76, 4p AD-D002 844/9, PAT-APPL-516 330
Supersedes AD-D000 556.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent avilable Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Acoustic arrays, *Hydrophones, *Patents, Sensitivity, Ceramic materials, Underwater sound, Acoustic detection, Elec-

troacoustic transducers, Fillers, Epoxy resins, Liquids.
Identifiers: PAT-CL-340-7.

The patent relates to a pressure sensitive hydrophone assembly which provides an undiminshed acoustic sensitivity while discriminating against waves induced in the material surrounding the hydrophone elements by flow and/or vibrational excitation. The hydrophone comprises a ceramic element surrounded by a rigid barrier and an elastic material inside the rigid barrier which is constructed to preclude the arrival of undesired forces at the ceramic element.

PATENT-3 961 305 Not available NTIS
Department of the Navy Washington D C
Fluid for Filling Sonar Transducers.
Patent,
Charles E. Green. Filed 14 Feb 75, patented 1 Jun 76, 7p AD-D002 905/8, PAT-APPL-550 067 Supersedes AD-D000 719.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Sonar transducers, *Patents, Glycols, Coupling(Interaction), Filling, Acoustic properties.
Identifiers: PAT-CL-340-8.

The patent relates to a transducer of acoustic energy through seawater which couples its active element to an acoustic window using polyalkylene glycol. The particular polyalkylene glycol selected exhibits improved acoustic, chemical, physical, and environmental properties. Two satisfactory liquids marketed under the trade designation's 'UCON Transducer Fluid 28' and 'UCON Lubricant LB-135' have satisfactory properties for being the coupling medium.

17B. Communication

AD-A029 177/3GA PC$4.00/MF$3.00
Martin Marietta Aerospace Orlando Fla Communications and Electronics Div
Integrated Tactical Communications System, Task I. Program Plan. Fourth Revision.
May 75, 36p Rept no. OR-12732-4
Contract DAAG39-73-C-0248
See also Task 2, AD-A029 181.

Descriptors: *Tactical communications, *Integrated systems, *Management planning and control, *Radio equipment, Scheduling, Critical path methods, Computer applications, Computations, Military requirements, Contracts, specifications, Planning.
Identifiers: AN/TRC Type equipment, AN/TSQ-84.

The object of this report is to provide a time-phased, event-oriented work plan for the entire contractual portion of the INTACS Study effort. The work plan presented is a concise translation of contract requirements into specific major tasks. The principal elements of this Program Plan are: (1) INTACS Master Program Plan, (2) INTACS Summary Performance Network, (3) INTACS Task Descriptions, (4) Government-Furnished Information (GFI), (5) Deliverable Items, and (6) Government-Furnished Computer Support Requirements.

AD-A029 181/5GA PC$4.50/MF$3.00
Martin Marietta Aerospace Orlando Fla Communications and Electronics Div
Integrated Tactical Communications System. Task II. Communications Support. Plan Formats. Implementation Plan Formats. Update Methodology.
Final rept.
Apr 74, 52p Rept no. OR-12988-1
Contract DAAG39-73-C-0248
See also AD-A029 182.

Descriptors: *Tactical communications, *Command and control systems, Management planning and control, Communication equipment, Integrated systems.

Task II of the INTACS Phase II program presents the communications support plan and the implementation plan formats for the mid range time frame. The information contained herein is organized to ensure that all areas of Army communications support are adequately described and properly documented. These areas include the elements of communications, doctrine, organization, materiel, and INTACS implementation. (Author)

AD-A029 182/3GA PC$9.75/MF$3.00
Martin Marietta Aerospace Orlando Fla Communications and Electronics Div
Integrated Tactical Communications System. Task IV. Refined Alternative MRTF Communications Concepts.
Final rept.
Apr 74, 321p Rept no. OR-12821-1
Contract DAAG39-73-C-0248
See also AD-A021 011.

Descriptors: *Tactical communications, *Command and control systems, Integrated systems, Communication equipment, Multichannel communications.

The results of the Task IV Study, 'Refined Alternative MRTF Communications Concepts,' provide a description of the baseline communications concept in terms of current doctrine, signal organizations, and materiel along with furnishing a review of INTACS goals, objectives, and communications support requirements for the mid range time frame. Each of the alternative concepts was also examined to determine its compliance with INTACS requirements. At the completion of the analysis, refinements and modifications are made in the form of doctrinal, organizational, and/or materiel changes or options to correct deficiencies and add capability to the systems in order to assure communications integrity. (Author)

AD-A029 183/1GA PC$4.00/MF$3.00
Martin Marietta Aerospace Orlando Fla Communications and Electronics Div
Integrated Tactical Communications System. Task XVII. EAD COMSR Conversion.
Final rept.
May 74, 44p Rept no. OR-13125
Contract DAAG39-73-C-0248
See also AD-A029 177.

Descriptors: *Tactical communications, *Command and control systems, Integrated systems, Communication equipment, Military requirements.

The methodology developed for conversion of communications support requirements (COMSRs) in Task XVII of the INTACS program offers a valid method for conversion of COMSR data for any additional force structure changes made during the mid range time frame. The EAD COMSR data base is an effective tool for use in the simulation of Army tactical communications systems in the INTACS program. (Author)

AD-A029 185/6GA PC$3.50/MF$3.00
Office of Naval Research London (England)
International Zurich Seminar on Digital Communication (1976) 9-11 March 1976.
Conference rept.,
D. C. Rummler. 22 Jul 76, 17p Rept no. ONRL-C-21-76

Descriptors: *Pulse communications, Digital systems, Voice communications, Symposia, Data transmission systems, Errors, Signal processing, Multiplexing.
Identifiers: *Digital communications, Meetings.

This report reviews selected papers presented at the 1976 International Zurich Seminar on Digital Communications which have potential application to military communication systems. The papers reviewed cover the areas of LSI technology in digital communications, high speed transmission systems, high-frequency channel error detection and correction, integrated picture-display and voice communication systems, architecture and design of a multiple-microprocessor network, error-detection and system reconfiguration in distributed signal processing systems and data network ciphering. (Author)

AD-A029 209/4GA PC$5.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
Results of Development Suitability Tests of the Lightweight Tactical Digital Facsimile AN/UXC-4( )(V).
Evaluation rept. Dec 75-Mar 76,
George T. Endsley. 28 May 76, 89p Rept no. NELC-TR-1987

Descriptors: *Facsimile communication, *Tactical communications, *Facsimile recording systems, Data compression, Charge coupled devices, Dry materials, Silver, Photographic paper, Resolution, Data links, Radio links, Telephone systems, Lasers.
Identifiers: Laser document scanning, Laser printing, AN/UXC-4, Digital systems.

The evaluation of the Tactical Digital Facsimile (TDF) and facsimile copy shows that the validation sets meet the essential requirements of the specifications, ie, 2, 4, 8, 16 and 32 shades of gray and resolutions of 96, 144 and 192 lines per inch, and data compressions of approximately 3-to-1 for gray scale and 5-to-1 for black and white. Although the validation sets have some 'shortcomings,' it is felt that most of them can be corrected in the full-scale development (FSD) model. Copy obtained from laser scanning is rated better than that obtained from charged-coupled-device (CCD) scanning. (Author)

AD-A029 225/0GA PC$4.50/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
NETDEN: An Interactive Network Design Graphics Simulation.
Final rept.,
Drayton D. Boozer, and Ralph K. Williams. Jul 76, 55p Rept no. WES-MP-K-76-4

Descriptors: *Communications networks, *Computer graphics, *Computer programs, *Data processing terminals, Fortran, Telecommunication, Computer program documentation, Computerized simulation, Maps, Visual aids, Subroutines, Data processing.
Identifiers: *NETDEN computer program, Fortran 4 programming language.

NETDEN is an interactive, network design, graphics simulation which displays one of five network designs for a set of user specified sites superimposed on an outline of the contiguous United States. The available designs are Minimum Mileage Star, Minimum Spanning Tree, Minimum Mileage Fixed Hub(s) Star, Minimum Mileage Ring, and Arbitrary Network. NETDEN is written in Fortran 4 and uses the U. S. Military Academy's Graphics Compatibility System graphics software. This document provides both an overview of NETDEN's capability as well as detailed user information. (Author)

AD-A029 288/8GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Acoustoelectric Convolvers for Programmable Matched Filtering in Spread-Spectrum Systems.
Journal article,
John H. Cafarella, Ernest Stern, William M. Brown, Jr., and John A. Alusow. 10 Oct 75, 5p
JA-4573, ESD-TR-76-196
Contract F19628-73-C-0002, ARPA Order-600
Availability: Pub. in Proceedings of the IEEE v64 n5 p756-759 May 76.

Descriptors: *Spread spectrum, *Secure communications, Communication equipment, Matched filters, Coding, Decoding, Antijamming.
Identifiers: *Acoustoelectric convolvers, Programmable signal processing, Reprints.

Acoustoelectric convolvers for a spread-spectrum communication application are described with a 100-MHz bandwidth. The use of convolvers as programmable matched filters provides the ability to change the coding waveform from bit-to-bit, thus offering improved multipath performance, security against decoding, and protection against repeat jamming. In this paper, we describe design and performance details of a prototype convolver which processes signals of 10 microsec duration with a 100-MHz bandwidth. A dynamic range of 50 dB is obtained, and error signals are 30 dB below the output signal with input signal levels of +14 dBm. A test circuit is described which creates typical spread-spectrum signals in which each bit is encoded into 512 chips and data is encoded by inverting the phase of an entire bit at a data rate of 100 kbits/s. (Author)

AD-A029 320/9GA PC$5.00/MF$3.00
Aeronautical Research Associates of Princeton Inc N J
Voice Communication Via Scattered Ultraviolet Radiation. Volume I.
Final Rept. 30 Dec 74-29 Dec 75,
E. Stokes Fishburne, Michael E. Neer, and Guido Sandri. Feb 76, 83p ARAP-274-Vol-1, ECOM-0115-F-1
Contract DAAB07-75-C-0115, ARPA Order 2875

Descriptors: *Ultraviolet communications, *Voice communications, *Electromagnetic scattering, *Atmospheric scattering, Xenon lamps, Ultraviolet filters, Photomultiplier tubes, Frequency modulation, Secure communications, Antijamming.
Identifiers: Nonline of sight, Daylight, Hydrogen flash lamps, Ultraviolet transmitters.

Nonline of sight voice communication has been accomplished in broad daylight via atmospheric scattering of ultraviolet radiation in the solar blind region of the spectrum. A frequency modulated high repetition rate hydrogenxenon flashlamp is used for the transmitter and a combination of solar blind filters and photomultiplier tube is used for the receiver. An analysis is presented to show the potential for a practical, short range, all weather, secure, jam resistant communications system. An experimental study has been performed to systematically determine the scattering and absorption characteristics of ultraviolet light in the lower atmosphere, in both clear and rainy weather. A simplified atmospheric scattering theory has been developed which shows excellent agreement with the observed data. The theory utilizes the generalized Henyey-Greenstein phase function modified to resemble Deirmenjian's phase functions for polydispersed aerosols. (Author)

AD-A029 325/8GA PC$4.00/MF$3.00
Bolt Beranek and Newman Inc Cambridge Mass
Private Line Interface Development. Packet Network Security. Packet Broadcast by Satellite.
Combined quarterly technical rept. no. 2, Apr-Jul 76,
D. C. Walden. Aug 76, 45p Rept no. BBN-3363
Contracts MDA903-76-C-0213, MDA903-76-C-0214
Continuation of Contracts, DAHC15-69-C-0179, F08600-73-C-0027 and F08606-75-C-0032.

Descriptors: *Packets, *Communication satellites, *Communications networks, *Interfaces, *Secure communications, Communications traffic, Computer programming, Time division multiplexing, Data processing security.
Identifiers: Computer networks, Computer software, *Private line interfaces, Packet broadcast, Packet switching.

This Quarterly Technical Report describes work on the development of a Private Line Interface, on end-to-end packet network security, and on the development of and experimentation with packet broadcast by satellite. (Author)

AD-A029 341/5GA PC$9.25/MF$3.00
Telcom Inc Vienna Va
NADIN System Design. Volume I. Sections 1 through 7,
W. S. Bean, P. J. Nichols, J. A. Schwartz, and Patrick V. McGregor. Aug 75, 297p FAA-RD-75-137-1
Contract DOT-FA74WA-3264
Prepared in cooperation with Network Analysis Corp., Glen Cove, N. Y., Contract TSC-338-029. See also Volume 2, AD-A029 342.

Descriptors: *Communications networks, *Data links, *Communication terminals, Message processing, Communications traffic, Modems, Costs, Specifications, Data processing, Air traffic control systems.
Identifiers: NADIN system.

The NADIN communications network is described herein in terms of functions and performance by nodes and links, respectively. The inter-relationships between nodes and links as well as the inter-relationships between hierarchical levels of nodes is described in terms of the respective resulting functions and performance criteria. (Author)

AD-A029 342/3GA PC$8.00/MF$3.00
Telcom Inc Vienna Va
NADIN System Design. Volume II. Appendices A thorugh G,
W. S. Bean, P. J. Nichols, J. A. Schwartz, and Patrick V. McGregor. Aug 75, 250p FAA-RD-75-137-2
Contract DOT-FA74WA-3264
Prepared in cooperation with Network Analysis Corp., Glen Cove, N. Y., Contract TSC-338-029. See also Volume 1, AD-029 341.

Descriptors: *Communications networks, *Data links, *Communication terminals, Message processing, Communications traffic, Cost analysis, Circuits, Air traffic control systems.
Identifiers: NADIN system.

No abstract available.

AD-A029 362/1GA PC$6.00/MF$3.00
Willlard Pennington Vandyke Inc Casselberry Fla
Time Division Multiplex (TDM) over Poor Quality Circuits.
Final technical rept. Jul 73-Jul 75,
Merwin W. Williard, and J. Pennington, III. Jun 76, 140p RADC-TR-76-192
Contract F30602-73-C-0358

Descriptors: *Time division multiplexing, *Synchronization(Electronics), *Burst transmission, *Data transmission systems, *Tropospheric scatter communications, Errors, Simulators, Fading(Electromagnetic waves), Asynchronous systems, Digital systems.
Identifiers: AN/GSC-24(V), Burst error simulators, Bit count integrity frame protection devices.

The objectives of this program were to study techniques, and implement hardware, which would permit the improvement of framing synchronization and maintenance of Bit Count Integrity between transmitter and receiver portions of asynchronous digital multiplexers operating in troposcatter transmission media. Existing literature was searched to obtain empirical data which was then used to calibrate a Burst Error Simulator which was designed to produce burst noise typical of existing troposcatter systems. A simplex Bit Count Integrity Frame Protection Device (BCIFPD) Transmitter and Receiver was built incorporating techniques for; continuous flywheel of framing synchronization through total signal loss; the addition of added redundancy coding to the command codes; and the correction of command code errors to restore Bit Count Integrity after deep fading. Testing of an existing asychronous multiplexer system was performed to show how it performed when burst error conditions typical of existing troposcatter transmission systems was injected between multiplexer and demultiplexer. Then the BCIFPD equipment was inserted into the test setup to show the improvement offered by that equipment. The BCIFPD equipment proved to contain much more capability than was necessary to provide good performance over typical troposcatter transmission links as defined by existing data. (Author)

AD-A029 368/8GA PC$3.50/MF$3.00
Bolt Beranek and Newman Inc Cambridge Mass
Speech Understanding Systems.
Quarterly technical progress rept no. 7, 1 May-31 Jul 76,
William A. Woods, L. Bates, G. Brown, B. Bruce, and C. Cook. Aug 76, 24p Rept no. BBN-3359
Contract N00014-75-C-0533, ARPA Order-2904

Descriptors: *Speech recognition, *Speech analysis, *Phonetics, *Syntax, *Semantics, Acoustics, Natural language, Grammars, Speech, Parsers, Errors, Linguistics.
Identifiers: *Speech understanding systems, Lexical retrieval.

This report describes recent progress of the BBN Speech Understanding Systems project covering the period from May 1976 to July 1976. The BBN Speech Understanding project is an effort to develop a continuous speech understanding system which uses syntactic, semantic and pragmatic support from higher level linguistic knowledge sources to compensate for the inherent acoustic indeterminacies in continuous spoken utterances. These knowledge sources are integrated with sophisticated signal processing and acoustic-phonetic analysis of the input signal, to produce a total system for understanding continuous speech. The system contains components for signal analysis; acoustic parameter extraction; acoustic-phonetic analysis of the signal; phonological expansion of the lexicon; lexical matching and retrieval; syntactic, semantic, and pragmatic analysis and prediction; and inferential fact retrieval and question answering, as well as synthesized text or spoken output. (Author)

AD-A029 373/8GA PC$5.50/MF$3.00
Michigan State Univ East Lansing Dept of Communication
Development of a Videotape Training Program on Communication for the Local Defense Civil Preparedness Director/Coordinator.
Research rept. May 74-Jun 76,

Erwin P. Bettinghaus, and Steven G. Sachs. Jun 76, 108p
Contract DCPA01-74-C-0277

Descriptors: *Communication equipment, *Video tape recording, *Computer aided instruction, *Training devices, Television display systems, Civil defense, Technology, Teaching machines, Learning machines, Learning, Media.

A communication training program utilizing videotape and classroom activities was developed for local defense civil preparedness coordinators. This report describes the communication content included in the program and the rationale for the selection of the instructional and media strategies used. The instructional development process used to design the training program is also presented. (Author)

AD-A029 406/6GA PC$4.00/MF$3.00
University of Southern California Los Angeles
Special Topics in Communications Research.
Final progress rept. 1 Jun 73-31 May 76,
Solomon W. Golomb. 26 Jul 76, 26p FPR-301, ARO-11547.5EL
Grant DA-ARO-D-31-124-73-G167

Descriptors: *Communications networks, *Graphs, *Pulse code modulation, Synchronization(Electronics), Prime numbers, Recursive functions.
Identifiers: Convolutional codes, Enumeration, Piccard's theorem, Undirected graphs.

This Final Report contains a brief overview of activities and accomplishments under the subject Grant, including a list of publications submitted and/or published by journals, degrees awarded, and a summary of some of the major technical achievements. It also incorporates the four Interim Progress Reports on this project as appendices. (Author)

AD-A029 547/7GA PC$9.75/MF$3.00
Computer Sciences Corp Falls Church Va
System Design Study for VHF Universal Data Link and DABS Combinations.
Final rept.,
Howard A. Blank. Feb 76, 325p FAA-RD-76-13
Contract DOT-FA-72WA-3072

Descriptors: *Data links, *Radio links, *Discrete address beacon systems, *Air traffic control systems, Very high frequency, Air to surface, Message processing, Access, Control.

This final report presents the results of a preliminary design of a VHF Universal Data Link System. Also presented are preliminary estimates of the design of the judicious selection of appropriate combinations of VHF Data Link and DABS coverage. The results of the study indicate that a VHF Universal Data Link System will greatly upgrade the capabilities of the current air/ground communication system. The implementation cost and complexity appear favorable when compared to the increased communications benefits. (Author)

AD-A029 563/4GA PC$5.00/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
Multipath Suppression Techniques.
Final rept. 7 Aug-8 Oct 75,
R. Streich, and G. McKelvey. 8 Oct 75, 77p
SAMTEC-TR-76-75
Contract F04701-72-C-0203

Descriptors: *Multipath transmission, *Radio reception, *Diversity reception, *Frequency diversity, Frequency modulation, Suppressors, Flight testing, Signal to noise ratio, Demodulators.
Identifiers: Polarization diversity, Combiners, Diversity combiners, SERTS(Signal Evaluation and Receiver Test Set), Signal evaluation and receiver test set.

This report demonstrates the effectiveness of frequency diversity combining in significantly reducing data loss due to multipath interference during aircraft flight tests. Laboratory test results are presented to show the effectiveness of employing the FM capture principle to suppress multipath interference. A limited amount of flight test data is presented on the FM capture technique due to equipment problems encountered. A final determination on the success of the FM capture technique has not been made. Test data indicates that newly developed, high performance diversity combiners should also reduce the data loss through polarization diversity combining. (Author)

AD-A029 666/5GA PC$3.50/MF$3.00
Bolt Beranek and Newman Inc Cambridge Mass
Speech Understanding Systems.
Quarterly technical progress rept. no. 7, 1 May-31 Jul 76,
William A. Woods, L. Bates, G. Brown, B. Bruce, and C. Cook. Aug 76, 24p Rept no. BBN-3359
Contract N00014-75-C-0533, ARPA Order-2904

Descriptors: *Speech recognition, *Signal processing, *Phonetics, *Labels, Syntax, Semantics, Natural language, Parsers, Phonemes.
Identifiers: *Speech understanding systems.

This report describes recent progress of the BBN Speech Understanding Systems project covering the period from May 1976 to July 1976. The BBN Speech Understanding project is an effort to develop a continuous speech understanding system which uses syntactic, semantic and pragmatic support from higher level linguistic knowledge sources to compensate for the inherent acoustic indeterminancies in continuous spoken utterances. These knowledge sources are integrated with sophisticated signal processing and acoustic-phonetic analysis of the input signal, to produce a total system for understanding continuous speech. The system contains components for signal analysis; acoustic parameter extraction; acoustic-phonetic analysis of the signal; phonological expansion of the lexicon; lexical matching and retrieval; syntactic, semantic, and pragmatic analysis and prediction; and inferential fact retrieval and question answering, as well as synthesized text or spoken output. (Author)

PATENT-3 934 204 Not available NTIS
Department of the Navy Washington D C
AM/AGC Weighted Diversity Combiner/Selector.
Patent,
Eugene R. Hill. Filed 4 Oct 74, patented 20 Jan 76, 20p AD-D002 893/6, PAT-APPL-512 273
Supersedes AD-D002 085.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Diversity reception, *Patents, Circuits, Receivers, Automatic gain control, Amplitude modulation.
Identifiers: *Combiner circuits, PAT-CL-325-304.

The patent relates to an AM/AGC weighted diversity combiner using the AGC and AM voltages from the AGC loops of a pair of receivers for generating an optimum weighting signal or combining ratio.

PATENT-3 958 214 Not available NTIS
Department of the Navy Washington D C
Encoded Echo-Ranging Signal Generator.
Patent,
Daniel E. Andrews, Jr., William E. Klund, and Robert D. Isaak. Filed 19 Jul 63, patented 18 May 76, 14p AD-D002 901/7, PAT-APPL-296 413
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coding, *Acoustic countermeasures, *Patents, Secure communications, Sonar signals, Echo ranging, Signal generators, Pseudo noise systems, Pseudo random systems.
Identifiers: PAT-CL-340-3, Sonar equipment, Underwater sound generators, Underwater communications.

An object of the patent is to provide a method and means for generating a unique encoded signal that may be simultaneously used as a secure communication signal and target-ranging signal without one adversely interfering with the other. Another object is to provide a method and means for broadcasting a communication-echo-ranging sonar signal that has a random noise appearance to a casual observer or an eavesdropper not having the knowledge or the key to the encoding thereof. A further objective is to provide an improved technique for generating a controlled pseudorandom noise signal.

PATENT-3 959 582 Not available NTIS
Department of the Navy Washington D C
Solid State Electronically Rotatable Raster Scan for Television Cameras.
Patent,
Robert L. Law, and Paul S. Catano. Filed 31 Mar 75, patented 25 May 76, 10p AD-D002 839/9, PAT-APPL-563 907
Supersedes AD-D000 742.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rasters, *Patents, Solid state electronics, Image tubes, Television cameras, Rotation, Scanning.
Identifiers: PAT-CL-178-6.8.

The patent describes an electronic system which develops a rotating raster in synchronism with a rotating image enabling a stationary image sensor to generate video signals for producing an erect, non-rotating image at a remote location. Sine and cosine signals are synchronously developed with the rotation of the image as a function of the instantaneous angle of the rotation. The sine and cosine signals are combined with linear vertical and horizontal sawtooth deflection signals and applied to the deflection means of the stationary image sensor to produce an erect, non-rotating video image on the face of a remote cathode ray tube display.

PATENT-3 965 422 Not available NTIS
Department of the Air Force Washington D C
System Channel Distortion Weighting for Predetection Combiners.
Patent,
Olindo A. Tagliaferri. Filed 26 Jul 74, patented 22 Jun 76, 10p AD-D002 849/8, PAT-APPL-492 077
Supersedes AD-164 820.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radio receivers, *Patents, Distortion, Tropospheric scatter communications, Signal processing, Multichannel.
Identifiers: Carrier to noise ratio, PAT-CL-325-305.

The patent relates to a tropo system channel distortion weighting apparatus for predetection combiners for modifying the predetection combiner algorithm to improve the output carrier to noise ratio in the presence of signal distortion.

PB-257 013/3GA PC$4.00/MF$3.00
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
FM Broadcast Coverage of the Coterminous United States.
George A. Hufford. Jul 76, 34p OTR-76-93

Descriptors: *Radio broadcasting, Frequency modulation, Radio transmission, Frequency allocation, Systems analysis, Communications management, Utilization.
Identifiers: Spectrum management, Spectrum utilization, Service areas.

This is a study of the radio system comprised by the FM broadcast stations and of how well it covers the coterminous United States. Using automatic processing techniques to manage the data base, to find the necessary environmental parameters, to compute the service ranges, and to produce the graphics, we have prepared maps which show the geographic distribution of the coverage in some detail. A further calculation reveals that 84% of the land area of the United States is served by at least one FM signal having a median field strength of 50 microvolts/m or more, and 53% is served by at least one having a median field strength of 1 microvolts/m or more. An analysis of the errors involved seems to show that while the representation of coverage by individual stations may sometimes be quite erroneous, the aggregate percentages quoted above should be accurate to within a percent.

PB-257 162/8GA PC$4.00/MF$3.00
National Bureau of Standards, Boulder, Colo. Time and Frequency Div.
A Satellite-Controlled Digital Clock.
Final rept.,
J. V. Cateora, D. D. Davis, and D. W. Hanson.
Jun 76, 49p* NBS-TN-681

Descriptors: *Clocks, *Data transmission, Digital techniques, Digital systems, Microcomputers, Coding, Correction, Time signals, Meteorological satellites, Radio relay systems.
Identifiers: Time codes, SMS satellites.

A digital clock, resettable and controlled by the time code relayed by NOAA's SMS/GOES Satellites, is discussed. The clock's design is based upon a four bit microprocessor and uses the redundancy of the data to improve its performance. Satellite position is included in the clock's display for delay corrections to the received time. A discussion of the generation, distribution, and reception of the time code is also included to aid the explanation of the clock's operation and performance.

17C. Direction Finding

PATENT-3 975 736 Not available NTIS
Department of Transportation, Washington, D.C.
Radio Theodolite Angle Measuring Apparatus.
Patent,
Harold I. Ewen, and George G. Haroules. Filed 11 Feb 75, patented 17 Aug 76, 8p* PB-257 019/0, PAT-APPL-549 081
Supersedes PB-239 531.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Theodolites, *Radio tracking, *Radio interferometers, *Patents, Aircraft, Monitors, Instrument landing systems, Bearing(Direction), Azimuth, Elevation, Measurement.
Identifiers: *Radio theodolites, PAT-CL-343-113.

The patent relates to an intermediate frequency interferometric technique and apparatus for the measurement of angles, for example the measurement of the elevation and azimuth bearing angles between an aircraft installed transmitter and a ground based receiver, are disclosed. Carrier and sideband signals emitted by a mobile transmitter are received by at least a pair of fixed position antennas, spaced at a nominal distance equivalent to the wavelength of the frequency separation between the transmitted carrier and its associated sideband, and the angle related path length difference between the transmitter and the spaced receiving antennas is measured in wavelengths at the carrier modulation frequency.

17D. Electromagnetic and Acoustic Countermeasures

PATENT-3 958 241 Not available NTIS
Department of the Navy Washington D C
Chaff Discrimination System.
Patent,
Donald J. Adrian. Filed 2 Nov 61, patented 18 May 76, 6p AD-D002 902/5, PAT-APPL-149 788
Previously filed as PAT-APPL-797 816, 6 Mar 59.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electronic counter countermeasures, *Patents, Guided missile fuzes, Target discrimination, Chaff, Microwave equipment, Polarization.
Identifiers: PAT-CL-343-7.

The patent relates to a chaff discrimination system for a missile fuze and more particularly to a means for discriminating between a target and chaff by using the difference in polarization properties of the echoes in a radio fuze system.

17E. Infrared and Ultraviolet Detection

AD-A029 394/4GA PC$3.50/MF$3.00
Pennsylvania State Univ University Park
An Experiment and Theoretical Investigation of Detection Statistics for Optical Frequency Radar Systems and Communication Systems.
Final rept. 1 Jul 73-30 Jun 76,
Gerard Lachs. 27 Jul 73, 8p ARO-11758.4-EL
Contract DAHC04-73-C-0036

Descriptors: *Laser communications, *Optical radar, Quantum statistics, Optics, Atmospheric motion, Turbulence, Absorption, Photons, Photodetectors, Photodiodes.
Identifiers: Photocount detection systems, Infrared detectors, Optical detectors.

There has been considerable interest recently in radar and communication systems which operate in the submillimeter, infra-red and optical regions of the spectrum. Each of these spectral regions has its own special problems, but common to all of these frequency ranges is that the detectors are quantum mechanical in nature. They involve the absorption of photons with corresponding changes in the state of an electron in the detector. There has also been interest in the detection statistics for multiple element optical frequency detectors such as quadrant detectors. The problems which have been investigated are the determination of the detection statistics for these radar and communication systems, and the joint detection statistics for multiple element detectors. (Author)

NTIS/PS-76/0729/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Night Vision Devices (Citations from the NTIS Data Base).
Rept. for 1964-Aug 76,
Guy E. Habercom, Jr. Sep 76, 155p*
Supersedes NTIS/PS-75/647, and NTIS/PS-75/055. See also NTIS/PS-76/0730.

Descriptors: *Bibliographies, *Low light level viewing, *Image intensifiers, Night vision, Night fire control, Vehicle detection, Personnel detection, Starlite scopes, Visual surveillance, Electronic reconnaissance, Abstracts.
Identifiers: *Night vision devices.

Various types of night vision devices are investigated in these Government-sponsored research reports. Most were developed for military applications but they can readily be adapted for civil usage, as, for example, law enforcement. Abstracts on display screens, equipment design and effectiveness, electronic components, spurious noise reduction, and test methods are cited. (This updated bibliography contains 150 abstracts, 27 of which are new entries to the previous edition.)

NTIS/PS-76/0730/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Night Vision Devices (Citations from the Engineering Index Data Base).
Rept. for 1970-Aug 76,
Guy E. Habercom, Jr. Sep 76, 76p*
See also NTIS/PS-76/0729.

Descriptors: *Bibliographies, *Low light level viewing, *Image intensifiers, Night vision, Night fire control, Vehicle detection, Personnel detection, Starlite scopes, Visual surveillance, Electronic reconnaissance, Abstracts.

Various types of night vision devices are investigated in these abstracts of reports gathered in a worldwide literature survey of professional and industrial publications. Display systems, equipment design and effectiveness, electronic components, spurious noise reduction, and test methods are among the items researched. (Contains 69 abstracts)

PB-256 866/5GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Black Coatings for Thermal Radiation Detectors.
Final rept.,
W. R. Blevin. 1973, 16p
Pub. in Proceedings of Smithsonian-Eppley Symposium on Solar Radiation, Measurements and Instrumentation, Rockville, Md., November 13-15, 1973, p18-31 1973.

Descriptors: *Thermal radiation, *Radiometry, *Detectors, *Infrared detectors, Optical coatings, Absorption, Solar radiation, Reflectance, Pyroelectricity, Polyvinyl fluoride, Gold, Optical properties, Optical measurement, Calibrating.
Identifiers: *Black coatings.

One of the most critical components of a thermal radiation detector is the black coating that serves to absorb the incident flux and then to conduct the heat to the underlying receiver. Methods for measuring the optical and thermal characteristics of black coatings are reviewed, and results are given for a few different types of coating. The effect of the thermal characteristics of the coating on the detector respon-

sivity is discussed, for both steady and modulated beams of radiation, and the related correction that is required with electrically calibrated detectors is described.

17G. Navigation and Guidance

AD-A029 311/8GA PC$6.00/MF$3.00
National Aeronautics and Space Administration Greenbelt Md Goddard Space Flight Center
Precise Time Dissemination Experiment Using the ATS-1 Satellite.
Final rept.,
A. R. Chi. Oct 75, 150p NASA-GSFC-636-18-51-08, FAA-RD-76-135

Descriptors: *Time standards, *Clocks, *Time signals, *Time, Scientific satellites, Data links, Real time, Spread spectrum, Synchronization(Electronics), Accuracy.
Identifiers: Time transfer, ATS-1 satellite.

A precise time transfer experiment using the Application Technology Satellite (ATS) as a link between a master and slave station achieved an accuracy of 50 nanoseconds one sigma. The technique is inherently capable of transferring precise time on a real time basis from a master time station to a number of slave stations. A conventional pseudo random noise (PN) code is used because of its spread spectrum properties. The low energy density and noise like signals can be transmitted coexisting with other transmissions without interference. Thus, the time transfer could be achieved via an existing satellite service. (Author)

AD-A029 396/9GA PC$3.50/MF$3.00
Army Aviation Test Board Fort Rucker Ala
Proposed Military Characteristics for Collision Warning Device.
28 Feb 57, 11p Rept no. USAATB-AVN-4356

Descriptors: *Warning systems, *Collision avoidance, *Terrain avoidance, Air space, *Aviation safety, Observation aircraft, Accuracy.
Identifiers: Low performance aircraft, Low visibility.

This report describes a simple device installed in aircraft to provide warning of conflicting air traffic or terrain obstacles under non-visual conditions. It will eliminate the requirement for traffic segregation of these aircraft by means of air space allocation under tactical nonvisual conditions, and will provide greater flight safety. It will be installed in those aircraft which require the capability of operating tactically under non-visual conditions but do not require the capability of habitual minimum altitude flight or remote area letdown, i.e., observation aircraft.

AD-A029 398/5GA PC$3.50/MF$3.00
Army Aviation Test Board Fort Rucker Ala
Service Test of Marker Beacon Receiver, AN/ARN-35.
30 Nov 55, 14p Rept no. USAATB-AVN-1654

Descriptors: *Radio beacons, *Radio receivers, Airborne, Army aircraft, Position finding, Navigational aids.
Identifiers: *AN/ARN-35, *Marker beacons.

The Marker Beacon Receiver, AN/ARN-35 was designed for use in Army aircraft to receive horizontally polarized 75 megacycle signals from ground transmitters modulated at either 400, 1,300, or 3,000 cycles per second, in order to indicate location of the aircraft over a known position on the ground. Marker Beacon Receiver AN/ARN-35 is a development model of the marker beacon receiver designated Radio Receiver R-(XA-89)/ARC-22 by the USAF. The receiver provides both aural output and visual indication.

AD-A029 405/8GA PC$5.50/MF$3.00
Syracuse Univ N Y Dept of Electrical and Computer Engineering
Effects of Scattering by Obstacles in the Field of VOR/DVOR.
Final rept. 18 June 74-18 June 75,
Harry Gruenberg, and Kazuhiro Hirasawa. Jul 76, 112p FAA-RD-76-21
Contract DOT-FA73WA-3272

Descriptors: *Radio navigation, *Electromagnetic scattering, *Radiofrequency interference, Wire, Cylinders, Ground stations, Errors, Very high frequency, Omnidirectional, Computer programs.
Identifiers: Scalloping, VOR Navigation, Course deviation errors.

Theoretical formulas, tables and graphs are presented which summarize the results obtained for the course deviation errors caused by scattering from wires and cylinders in the vicinity of a VOR station. A summary and an analysis of some experimental results are presented. The experiments were carried out at NAFEC near Atlantic City. On the whole the agreement between theory and experiment is satisfactory. A listing of modified and simplified computer programs is included. (Author)

AD-A029 482/7GA MF$3.00
Defense Systems Management School Fort Belvoir Va
Cost Effective ILS. A Case Study and Evaluation.
Study project rept.,
James R. Grubb. Nov 74, 55p
Availability: Microfiche copies only.

Descriptors: *Logistics support, *Cost effectiveness, *Inertial navigation, *Systems management, Naval procurement, Integrated systems, Cost estimates, Life cycle costs, Display systems, Stabilized platforms, Avionics, Doppler radar.
Identifiers: *Integrated logistic support.

The purpose of this case study is to determine, through the analyses of the acquisition of a system, the areas which impact achieving ILS in a cost effective manner. The problem areas are identified in the case and recommendations are made to correct situations which impair achieving cost effective ILS. (Author)

JPRS-67628 PC$7.50/MF$3.00
Joint Publications Research Service, Arlington, Va.
Inertial Navigation Systems. Part I,
L. I. Tkachev. 20 Jul 76, 185p
Trans. of mono. Sistemy Inertsialnoi Orientirovki, Uchebnoe Posobie, Chast I, Osnovnye Polozheniya Teorii, Moscow, p15-186, 201-212 1973.

Descriptors: *Inertial navigation, Gyroscopes, Gyrostabilizers, Stabilized platforms, Translations, USSR.

The book contains the theoretical premises of the theory of inertial navigation systems. Principles of operation of gyroscopes, gyrostabilizers and gyroplatforms are discussed. An exhaustive Soviet and foreign bibliography is appended.

PAT-APPL-683 997/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
A Non-Tumbling Limit Stop Providing a Mechanical Super Cage.
Patent Application,
Hughes M. Zenor, and John C. Weaver. Filed 6 May 76, 14p AD-D002 875/3
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Guided missile components, *Gyroscopes, Gyro stabilizers, Gimbals, Friction, Slewing.
Identifiers: *Patent applications, PAT-CL-74-5.

The patent application relates to a non-tumbling limit stop for limiting the relative motion between a structure and a gyroscope pivotably mounted thereon. The limit stop employs frictional contact forces to cause the gyroscope to precess away from the stop rather than tangent to it, and thus prevents tumbling of the gyroscope while enabling high slew rates of the gyroscope spin axis. In some missile applications it is desirable that the gyro mounting only allow limited relative movement between the gyro spin axis and the missile structure. This is usually accomplished by mounting limit stops near the gyro so that when a non-spinning portion of the gyro case approaches and contacts the limit stop the spin axis will be slewed by the limit stop to assume a new orientation in space.

PAT-APPL-695 614/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Self Learning Monitor for VLF Wave Propagation.
Patent Application,
Eric L. Swanson. Filed 14 Jun 76, 15p AD-D002 885/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Monitors, *Global positioning system, Radio transmission, Very low frequency, Electromagnetic wave propagation, Abnormalities, Self organizing systems, Radio navigation.
Identifiers: *Patent applications, PAT-CL-340-146.3.

The patent application relates to a monitor for notifying a vehicle using VLF navigation of an abnormal condition of VLF wave propagation. Sensing means, including an antenna, oscillator, IF mixer, and phase tracker is provided to periodically sense changes in the phase angle of a VLF wave received by the monitor, and to couple a succession of values of an updating quantity into a data processing means, each value corresponding to a sensed amount of phase change. The data processing means learns what comprises a normal condition of VLF wave propagation by averaging successive values of the updating quantity, and provides notice of an abnormal condition whenever a received value of the updating quantity varies from the previously computed average by an amount in excess of a preselected criterion.

PB-257 215/4GA PC$12.00/MF$3.00
National Ocean Survey, Rockville, Md.
United States Coast Pilot 7, Pacific Coast California, Oregon, Washington, and Hawaii. Twelfth Edition - June 1976.
Jun 76, 454p NOAA-76062930
Supersedes COM-75-11051.

Descriptors: *Navigational aids, *Coasts, *Waterways(Transportation), Navigational charts, Regulations, Water traffic, Oceanographic surveys, Climate, Anchorages, Tables(Data), Weather, Ice, Harbor facilities, Marine terminals, California, Oregon, Washington(State), Hawaii.
Identifiers: Intercoastal waterways.

The Coast pilots are a series of eight nautical books that cover a wide variety of important information for navigators of the United States coastal and intracoastal waters. Coast Pilot subjects include navigation regulations, outstanding landmarks, channel and anchorage peculiarities, dangers, weather, ice, freshets, routes, pilotage and port facilities.

17H. Optical Detection

AD-A029 411/6GA PC$4.00/MF$3.00
Naval Electronics Lab Center San Diego Calif
Underwater Range Measurements. Electro-optical Techniques as an Aid in Positive Coupling of the Deep Submergence Rescue Vehicle (DSRV) with a Disabled Submarine.
Technical rept. Nov 75-Apr 76,
W. H. Whitman. 12 Jul 76, 45p Rept no. NELC/TR-1992

Descriptors: *Distance measuring equipment, *Optical radar, Underwater equipment, *Range finding, *Deep submergence rescue vehicles, Electrooptics, Light emitting diodes, Photodiodes, Submarine escape, Sea water, Silicon, Hatches, Parallel orientation, Interfaces.

Pilots of a Deep Submergence Rescue Vehicle (DSRV) have experienced difficulty attaining a trim attitude for coupling with the hatch of a simulated disabled submarine. To provide navigation information during this crucial maneuver, electro-optical technology was investigated to measure the separation distance of the two vehicles. The effectiveness of a light-emitting-diode (LED) and a photodiode ranging unit in water was analyzed and demonstrated. Analysis indicated an optimum source wavelength of 690 nm for the device as conceived rather than a blue-green source. LEDs are available at this wavelength with sufficient radiant power to measure a range of less than 10 feet in water. The feasibility of underwater ranging was demonstrated. The ranging device used for the feasibility tests was originally designed for other purposes. With the recommended changes, the electro-optical underwater ranging system will provide an accurate measurement of the coplanarity between the DSRV and a disabled submarine. (Author)

AD-A029 564/2GA PC$5.50/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
CAMDAT Improvement Analysis.
Final rept. 17 Oct 73-14 Jun 74,
Mikiso Mizuki. 14 Jun 74, 114p SAMTEC-TR-75-168
Contract F04701-72-C-0203

Descriptors: *Optical tracking, *Computer programs, *Radar tracking, *Guided missile tracking systems, Surface to surface missiles, Passive systems, Data reduction, Theodolites, Motion picture cameras, Reentry vehicles, Descent trajectories, Guided missile trajectories.
Identifiers: Cinetheodolites, CAMDAT computer program.

Presently SAMTEC has a software package called CAMDAT, which has been used for the data reduction of long range optics data. Changes in tracking performance and requirements impose the necessity of reviewing the overall problems of optics data reduction. A brief review of the potentials of optics data in trajectory estimation is given first. This is followed by two-part discussion of trajectory estimation problems of powered objects and free fall objects. Part I deals with the problems of powered objects and discusses the limitations and deficiencies of the CAMDAT program. It also enumerates a number of potential methods which can be explored to fill the future needs. Part II is devoted to the discussion of NITE simulation and trial runs, which are operated under free fall constraints. The results indicate the soundness of the free fall trajectory estimation technique using NITE or FIAT. Unfortunately, the extent of the investigatory analysis undertaken to this date has been limited, and indicates the desirability of continued research and experimentation. A short discussion appearing in Part III identifies future problems for continuation of work. (Author)

17I. Radar Detection

AD-A029 141/9GA PC$4.00/MF$3.00
Naval Air Systems Command, Point Mugu, Calif. Target and Range Div.
Nike-Hercules Modification Catalog.
1976, 44p

Descriptors: *Guided missile tracking systems, *Radar, *Modification, Instrumentation, C band, Ka band, X band, Mounts, Modification kits.
Identifiers: Nike-Hercules, Tracking radar, Surplus equipment.

Many agencies, both in government and industry, are actively using and modifying the Nike-Hercules radars surplused by the Army. Still other agencies plan future modifications. It is anticipated that this situation will continue as long as this surplus equipment can be modified with significant cost savings to the user. To avoid duplication of design effort, development effort and cost, this catalog has been developed describing the Nike-Hercules modifications completed or in progress on Navy ranges. Additional descriptions of modifications are desired from all agencies, government and civilian. Inputs are therefore invited and encouraged.

AD-A029 240/9GA PC$4.50/MF$3.00
Hughes Aircraft Co Fullerton Calif Ground Systems Group
Surface Wave Chirp Transform Correlator.
Final rept. 15 Dec 75-15 May 76 on Phase 1,
Henry M. Gerard, and Oberdan W. Otto. Aug 76, 75p FR-76-14-502, ECOM-76-1298-F
Contract DAAB07-76-C-1298

Descriptors: *Chirp radar, *Signal processing, Surface waves, Transformations, Reflection, Signal to noise ratio, Pulse compression, *Correlators, Radar pulses.
Identifiers: Chirp transform correlators, SAW devices, Reflective array compressors.

The feasibility of developing a surface wave chirp transform correlator (CTC) is evaluated. A comprehensive characterization of chirp transform (CT) signal processing is presented. A computer model for simulating CT processors is described, with numerous examples included. Error sensitivities and critical development risks to CTC development are evaluated. A hardware implementation is proposed which utilizes large TB product surface wave RAC filters. Signal to noise ratio and dynamic range of this implementation are projected. It is concluded that the development of a CTC for compressing waveforms up to 60 microseconds long, with up to 60 MHz bandwidth is feasible based on presently available technology. (Author)

AD-A029 262/3GA PC$5.00/MF$3.00
Communications Research Centre Ottawa (Ontario)
Radar Detectability of Light Aircraft,
M. V. Patriarche, G. O. Venier, and J. R. Lewis. Apr 76, 79p Rept no. CRC-1291

Descriptors: *Target detection, *Airplanes, Coherent radar, Airport radar systems, Moving target indicators, Radar cross sections, Aircraft, Probability density functions, Air traffic control systems, Search radar, Radar reflections, Canada.
Identifiers: Light aircraft, ASR-5 radar, Cessna 172 aircraft, Cessna 177 aircraft, Cherokee 140 aircraft.

A study has been made of the factors determining the ability of radar to detect light aircraft. Previously published work in this area was reviewed, and two series of experiments, in the time frame 1973 - 1975, were carried out to investigate the characteristics of the radar echo from light aircraft in flight. One series of experiments was carried out using the calibrated CRC coherent radar. The other series, conducted with the cooperation of the Ministry of Transport, made use of an operational Air Traffic Control radar. The findings of the study are summarized, and recommendations are made concerning the design, siting, and operation of Air Traffic Control primary radars to improve their detection performance.

AD-A029 486/8GA PC$4.50/MF$3.00
National Aviation Facilities Experimental Center Atlantic City N J
Test and Evaluation of ATCRBS Electronic Scan Antenna (System Test).
Final rept. Jan 73-Jun 75,
Anthony D. Bradley. Aug 76, 55p FAA-NA-75-73, FAA-RD-76-97

Descriptors: *Air traffic control radar beacon systems, *Radar antennas, *Phased arrays, Electronic scanners, Monopulse radar, Target detection, Airport Radar systems, Radar beacons.
Identifiers: *Electronic scan antennas.

The air traffic control radar beacon system (ATCRBS) experimental electronic scan antenna (ESA) consists of 56 array modules placed on a platform (ring) constructed around the top of an airport surveillance radar tower. A shelter beneath the tower provides an enclosure for the control and radiofrequency distribution system of the ESA. This final report covers the system testing to demonstrate the ATCRBS ESA dynamic capabilities in typical terminal environment and to examine beacon monopulse performance. It is concluded that the computer-controlled ATCRBS ESA demonstrated the automated features of the antenna, including agile beam management. In addition, the ATCRBS ESA monopulse target detection system was exercised during the flight test effort. This testing established that the field environment and aircraft maneuvering affected the resulting parameters of system operation (i.e., azimuth accuracy and received signal level). Basic monopulse target detection and processing is feasible for the ATCRBS. (Author)

AD-A029 562/6GA PC$3.50/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
Radar Range Bias Corrections.
Final rept.,
R. E. Roy, and D. C. Schwark. 24 Sep 74, 17p SAMTEC-TR-76-76
Contract F04701-72-C-0203

Descriptors: *Radar range calibrators, *Range finding, *Radar beacons, *Radar tracking, Accuracy, Bias, Errors, Digital computers, Delay, Calibration, Bandwidth, Radar receivers, Gates(Circuits).

Over past years, SAMTEC has developed, modified, and improved techniques that determine range bias corrections (sometimes called 'range zero sets') from controlled on-site calibration tests. A goal of this evolutionary process is to continually improve in a practical and realistic sense the quality of range bias corrections in order that subsequent applications of the corrections (Post operationally) to measured ranges will result in a more accurate range data product that is supplied to a User. This report documents in detail the present SAMTEC technique and procedure that is used to derive range bias corrections from data provided by on-site calibration tests. (Author)

AD-A029 565/9GA PC$3.50/MF$3.00
Federal Electric Corp Vandenberg AFB Calif
Missile Impact Positions Determined from Scanning Radars.
Final rept.,
Russell E. Roy. 25 Jul 74, 22p SAMTEC-TR-75-167
Contract F04701-72-C-0203

Descriptors: *Impact computers, Search radar, *Radar scanning, Water jets, *Water entry, *Guided missile tracking systems, Radar targets, Guided missiles, Position finding, Wind velocity, Wind direction, Weighting functions, Least squares method.
Identifiers: Missile plumes, Water plumes, *Impact prediction.

A determination of missile impact position coordinates from several plume positions measured by scanning radars is described. The coordinates are calculated according to a weighted least squares criterion where the plume positions are constrained to follow the speed and direction of the wind. Corrections for (1) target dependent effects caused by plume expansion after impact and (2) a down range shift from impact of the initial plume position (Due to kinetic energies of impact) are incorporated in the determination of impact position coordinates. Covariances, variances, error ellipses, residuals, and down/cross range uncertainties are also calculated with the mathematics provided. Results obtained from applications of this technique to data from Operations 8633, 4103, and 6667 are presented both numerically and graphically. Summary remarks concerning accuracy of the results are included in the report. (Author)

PAT-APPL-587 171/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Constant False Alarm Rate (CFAR) Circuitry for Minimizing Extraneous Target Sensitivity.
Patent Application,
Richard P. Perry, and Harry Urkowitz. Filed 16 Jun 75, 18p AD-D002 865/4
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Signal processing, Threshold effects, Target detection, Sensitivity, Circuits, Radar equipment.
Identifiers: CFAR(Constant False Alarm Rate), Constant false alarm rate, *Patent applications, PAT-CL-343-7.

CFAR systems may become ineffective when extraneous targets present in threshold control cells raise the threshold detection level to such a point that the target in the cell being tested becomes obscured. A principal object of the patent application is to avoid the effect of extraneous targets by providing a CFAR processor capable of sensing their presence in one or more of the threshold control cells and of removing the targets from the computation which produces the threshold detection level.

PAT-APPL-587 475/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Target Detection Method and Apparatus for Reducing Range-Smearing Error Caused by Relative Target Motion.
Patent Application,
Leonard Weinberg. Filed 16 Jun 75, 10p AD-D002 867/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Target detection, *Signal processing, Sampling, Integration, Shift registers, Communication and radio systems, Motion.
Identifiers: PAT-CL-343-13, *Patent applications.

The patent application relates generally to radar and communications systems operating on a sampling basis to detect targets in discrete range samples. Pulse returns received as discrete range samples are averaged, summed with each new range sample and stored individually in cells of a shiftable register. Undesirable range smearing due to relative movement of the target is avoided by aligning each new range sample with the closest of the previously-stored sums. A control signal is generated to represent the estimated relative movement of the target for a particular interpulse period. Alignment is achieved by then shifting the register responsively to the control signal so that the closest stored range sample is summed or integrated with the new, incoming range sample.

PATENT-3 965 428 Not available NTIS
Department of the Air Force Washington D C
Spectrum-Shape Discriminating On/Off Target Indicator.
Patent,
Joel Katz, and James R. Pousson. Filed 4 Jan 71, patented 22 Jun 76, 5p AD-D002 850/6, PAT-APPL-105 748
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Target discrimination, *Patents, Power levels, Target strength, Spectrum signatures, Signal to noise ratio.
Identifiers: PAT-CL-325-474.

The patent relates to a spectrum-shaped discriminating on/off target indicator which indicates if a signal simultaneously meets prescribed conditions on power level and spectrum shape. Signal power level and spectrum width are simultaneously measured and a DC logic output is obtained only for input signals which have a signal-to-noise ratio equal to, or higher than a preset minimum level though the signal 'noise bandwidth' meets the prescribed conditions.

PATENT-3 965 470 Not available NTIS
Department of the Air Force Washington D C
Pulse Analyzer for an RF Moving Target Detector.
Patent,
Glenn G. Clinard, Kenneth C. Guth, Gail R. Mulhollam, and Frank J. Volk. Filed 13 Dec 72, patented 22 Jun 76, 6p AD-D002 852/2, PAT-APPL-314 645
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Moving target indicators, *Pulse analyzers, *Patents, Range(Distance), Threshold effects, Range(Extremes), Range finding.
Identifiers: Closest point of approach, PAT-CL-343-5.

The patented pulse analyzer determines when a moving target has passed the closest-point-of-approach or when the target comes to within a predictable minimum range with respect to the antenna. The pulse analyzer is fed threshold count pulses from the threshold counter in the RF moving target detector. The first output from the pulse analyzer is the OGT (outgoing target) pulse which occurs when the peak-to-peak amplitude excursions of the antenna impedance characteristics of the RF detector begin to decrease. The second output is the INB (inner boundary) pulse which occurs when the target moves to within a predictable minimum range.

PATENT-3 965 471 Not available NTIS
Department of the Air Force Washington D C
Radiation Detection System.
Patent,
Floyd A. Haeuszer. Filed 13 Aug 69, patented 22 Jun 76, 8p AD-D002 853/0, PAT-APPL-851 151
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pulse generators, *Patents, Radar equipment, Transients, Detectors, Circuits, Trigger circuits.
Identifiers: *Clamping circuits, PAT-CL-343-18.

This invention relates to radar systems employing circumvention techniques, and in particular to a radiation detection system and subsystem capable of delivering clamping signals as required in circumvention circuits. The clamping signal is present from the time the transient rises above a given threshold level and for a known duration thereafter. The system includes radiation sensors, a blocking oscillator that generates a pulse in response to each sensor signal, and an output pulse duration control circuit. The oscillator pulses are fed simultaneously to the output pulse duration control circuit and to an OR gate, the output of which comprises the system output. The output pulse duration is controlled by the time required to magnetize a magnetic core to saturation in first one direction and then the other.

17J. Seismic Detection

AD-A029 380/3GA PC$5.00/MF$3.00
Army Engineer Waterways Experiment Station Vicksburg Miss
Generation and Propagation of Microseismic Signals from Footsteps.
Final rept.,
Jerry R. Lundien, and Bob O. Benn. Sep 73, 95p Rept no. WES-MP-M-73-12

Descriptors: *Terrain, *Microseisms, *Intrusion detection, Seismic signatures, Seismic detection, Terrain models, Rayleigh waves, Antiintrusion devices, Time domain.
Identifiers: *Footsteps.

A study was conducted to investigate the generation and propagation of microseismic signals from man-walking targets. To illustrate the relation between terrain parameters and Rayleigh wage generation and propagation, the problem was divided into four parts, which were then studied graphically. These parts were: (a) the target-ground interaction, (b) energy coupling to the substrate, (c) Rayleigh wave propagation from the source, and (d) transmission of Rayleigh waves over surface macrogeometry features. Parameters that are included in the terrain model are: (a) surface rigidity in terms of nonlinear surface spring constants and (b) subsurface rigidity in terms of seismic properties (wave velocities and bulk density) and layer thickness. The terrain combinations include a wide variation in site conditions and have realism in terms of environments found in nature. Sample problems are included to demonstrate the signal construction techniques and are analyzed to show the effect of the various terrain parameters on the generation and propagation of the Rayleigh waves.

AD-A029 548/5GA PC$5.00/MF$3.00
California Univ Los Angeles Inst of Geophysics and Planetary Physics
Regionalization of the Arctic Region, Siberia and Eurasian Continental Area.
Final rept. 1 Mar 73-31 May 76,
Leon Knopoff. 31 May 76, 87p AFOSR-TR-76-1027
Contract F44620-73-C-0048, ARPA Order-1827

Descriptors: *Seismic waves, *Earthquakes, *Underground explosions, *Asia, *Europe, Discrimination, Rayleigh waves, Surface waves, Epicenters, Determination, Wave propagation, Intensity, Earth crust, Structural geology, Computer programs, Computations, Seismographs,

Velocity, Seismological stations, Arctic regions, Siberia.
Identifiers: Seismic discrimination.

In this investigation, the first purpose is the regionalization of the Arctic region, Siberia and the Eurasian continental area using seismic surface waves. This regionalization will determine the structural properties of the upper few hundred kilometers of the earth, and the variation of these properties from one subregion to another in the area under investigation. Once the structural properties in the various regions have been obtained, the second purpose is to apply optimized computer techniques to the computation of accurate theoretical seismograms for any hypothetical type of source located anywhere within this continental area. These theoretical seismograms can be applied directly to the discrimination problem by comparing seismograms, computed for both earthquakes and underground explosions, with the actual recorder seismogram. (Author)

AD-A029 560/0GA PC$5.00/MF$3.00
Texas Instruments Inc Dallas Equipment Group
Counterevasion Studies - the Effects of Noise, Dissimilarity, and Prefiltering on Cepstrum Analysis.
Semi-annual technical rept. no. 5, (pt. B), 1 May-31 Oct 75,
David Sun. 30 Nov 75, 82p TI-ALEX(02)-TR-75-02-pt-b, AFOSR-TR-76-1064
Contract F44620-73-C-0055, ARPA Order-1827
See also AD-A029 559.

Descriptors: *Underground explosions, *Nuclear explosions, *Seismic signatures, Signal processing, Cepstrum technique, Band pass filters, Delay circuits, Signal to noise ratio, Seismic arrays, Seismology, Noise, USSR.
Identifiers: Prefiltering, Kazakh(USSR).

The effects of the noise, the dissimilarity, and the prefiltering on the detection of the P-pP delay time and the successful decomposition of the mixed P- and -pP wave by employing the cepstrum analysis are studied here. These effects have been investigated by extracting the direct P-phases and the surface reflected pP-phases from several presumed underground explosions in eastern Kazakh, and remixing them at various time delays with the addition of various levels of the realistic seismic noise. The quality of the cepstrum analyzed results as a function of the signal-to-noise ratio, the delay time, and the dissimilarity between the P-phase and the pP-phase have been obtained for a number of such events. In general, it is found that the cepstrum analysis can detect the P-pP delay time as short as 0.4 second and successfully recover the P- and the pP-phases for the signal-to-noise ratio down to about 12 dB. When the similarity coefficient between the P- and the pP-phases is less than 1.0, the detection of the P-pP delay time becomes not so obvious as it is when they are identical. The dissimilarity between the P-Phase and the pP-phase will affect the detection of the P-pP delay time more seriously than the noise in the cepstrum analysis.

AD-A029 667/3GA PC$4.50/MF$3.00
Lamont-Doherty Geological Observatory Palisades N Y
Long-Period Seismological Research Program.
Final rept. 15 Mar 71-30 Apr 76,
Lynn R. Sykes, and Donald W. Forsyth. 30 Jun 76, 63p AFOSR-TR-76-0932
Contract F44620-71-C-0082, ARPA order-1827

Descriptors: *Seismic detection, Seismological stations, Seismographs, Atmospheric disturbances, Rayleigh waves, Surface waves, Wave propagation, Anomalies, Intensity, Signal to noise ratio, Matched filters, Earth crust, Time, Arrival, Signal processing, Earthquakes, Underground explosions, Discrimination, Asia.
Identifiers: Earth noise, Seismic discrimination.

During the first year of the subject contract, five high-gain, long-period (HGLP) seismograph stations were maintained and a sixth station was installed and maintained. Research completed under this contract included investigation into the characteristics of long-period earth noise, the detection capabilities of the high-gain stations, digital signal enhancement techniques, and new methods of distinguishing earthquakes from underground explosions, as well as several studies in general seismology using high-gain data. A detailed study of earth noise at all 11 HGLP sites found that the spectra of earth noise at each site is characterized by a minumum in the period range 25 to 45 seconds. The level of earth noise recorded by vertical seismographs is independent of local meteorological conditions, but at shallow sites, the earth noise levels recorded by horizontal seismographs exhibit a diurnal cycle associated with daily variations of atmospheric turbulence. The horizontal earth noise associated with atmospheric turbulence is attenuated by overburden to about 10% of the surface noise level at a depth of about 150 m. A new surface wave magnitude scale based on the amplitude of higher-mode Rayleigh waves was developed and applied to earthquakes and explosions in central Asia. In other investigations, surface waves were used to study the focal mechanism of small magnitude events, the pulse distortion of body waves travelling non-minimum time paths was computed, and the use of seismograph arrays in determining earth structure was examined.

18. NUCLEAR SCIENCES AND TECHNOLOGY

18E. Nuclear Power Plants

AD-A029 457/9GA PC$6.75/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Nuclear Engineering
Conceptual Design of a Small HTGR for Total Energy Applications at Military Installations.
Final rept.,
J. I. Shin, and M. J. Driscoll. May 75, 157p
USAFESA-RT-2003
Contract DAAK02-74-C-0308

Descriptors: *Nuclear power plants, *Electric power production, *Military facilities, Gas turbines, Reactor coolants, Reactor cores, Cost estimates, Pressure vessels.
Identifiers: *High temperature gas cooled reactors.

A conceptual design for a small HTGR in the 100 MWe size range is described. The reactor drives indirect closed-cycle gas turbine power conversion units using helium as the working fluid and provides both electricity and thermal energy (via a 380 F hot-water utility system) to serve the projected needs of large US Army installations and industrial facilities in the continental US in the post-1985 time frame. The overall system design combines many of the proven features of the Peachbottom I reactor, the Fort St. Vrain HTGR core, and Oberhausen II turbomachinery. The major unique feature is the use of an indirect power cycle, with helium-to-helium intermediate heat exchangers. Cost estimates are summarized which indicate the ability of the gas turbine cycle to discharge waste heat at a useful temperature gives the HTGR/GT system a significant advantage over nuclear and fossil-fired Rankine systems even though it is inferior to LWR systems on an electric-only basis. The fossil-fired-gas-turbine total-energy concept is identified as its major competitor for the present application.

PB-257 658/5GA PC$4.00/MF$3.00
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulations.
Operation of Offshore Power Systems Floating Nuclear Plants (1-8). Supplement Number 1. Docket No. STN 50-437.
Safety Evaluation rept.
16 Mar 76, 49p NUREG-0054-Suppl-1
See also PB-245 405.

Descriptors: *Nuclear power plants, *Offshore structures, Site surveys, Nuclear reactor safety, Nuclear reactor engineering, Radioactive wastes, Radiation shielding.
Identifiers: *Offshore nuclear power plants.

Supplement No. 1 to the Safety Evaluation Report of Offshore Power Systems Floating Nuclear Plants (1-8), (Docket No. STN 50-437) for a license to manufacture eight standardized floating nuclear plants. The purpose of this supplement is to update the Safety Evaluation Report by providing (1) evaluation of additional information submitted by the applicant since the issuance of the Safety Evaluation Report and (2) the results of a review of technical areas for which review was not yet completed at the time of issuance of the Safety Evaluation Report.

18F. Radiation Shielding and Protection

JPRS-67629 PC$3.50/MF$3.00
Joint Publications Research Service, Arlington, Va.
Personal Protection in the Event of Radiation Accidents,
S. M. Gorodinskii, M. I. Rokhlin, and V. L. Shcherbakov. 20 Jul 76, 11p
Trans. of mono. Individualnaya Zashchita pri Radiatsionnykh Avariyakh, Moscow, n.d. p363-370.

Descriptors: *Protectors, *Radiation protection, *Protective clothing, Efficiency, Accidents, USSR, Translations, Respiratory system, Skin(Anatomy), Radiobiology, Safety, Experimental data, Humans.

The report contains a description of a procedure for evaluating the protective efficiency of various types of personal protection equipment with respect to radioactive substances using a specially designed chamber. Descriptions are given of suits for use in radiation accidents.

JPRS-67630 PC$3.50/MF$3.00
Joint Publications Research Service, Arlington, Va.
Decontamination of Protective Coatings and Personal Protection Equipment,
S. M. Gorodinskii, and D. S. Goldshtein. 20 Jul 76, 12p
Trans. of mono. Dezaktivatsiya Zashchitnykh Pokrytii i Sredstv Individualnoi Zashchity, Moscow, n.d. p567-574.

Descriptors: *Radiation protection, *Protective clothing, *Decontamination, *Protective coatings, Methodology, Evaluation, USSR, Translations, Research.

The report contains a discussion of problems in evaluating methods of decontaminating various types of coatings and personal protection equipment. Means of further improvement in these methods are also considered. Results of past research are presented.

18G. Radioactive Wastes and Fission Products

PB-257 453/1GA PC$4.00/MF$3.00
Oregon State Univ., Corvallis. Dept. of Nuclear Engineering.
Evaluation of Fission Product After-Heat.
Quarterly rept. Jan-31 Mar 76,
Bernard I. Spinrad. Sep 76, 44p NUREG-0018-3
Contract NUREG-RLR-74-4/OSU
See also PB-251 741.

Descriptors: *Fission products, *Radioactive decay, Gamma ray spectra, Estimates, Tables(Data).
Identifiers: Reactor shutdown.

Reported here are studies on: estimation of fission-product gamma spectra; comparisons of theoretical predictions of fission-product decay power with ongoing experimental programs; and a protocol for estimating bias in decay energy estimates for fission products which have not been experimentally determined. In addition, brief progress statements are entered for continuing items of work which pertain to the goal of this project at OSU: to put the understanding of short-term decay power, from fission products and other predictable radioactive species, in a shut-down reactor of realistic operating history on a well-documented, scientific basis.

18H. Radioactivity

PB-257 307/9GA PC$4.50/MF$3.00
Environmental Protection Agency, Cincinnati, Ohio. Water Quality Office.
Radioactivity Levels in the Environs of the Rocky Flats Plutonium Plant, Golden, Colorado 1970.
Apr 71, 57p

Descriptors: *Water pollution, *Radioactive wastes, *Plutonium, Colorado, Water quality management.
Identifiers: *Water quality data, Golden(Colorado), Boulder(Colorado).

During the week of February 23, 1970, representatives of the Water Quality Office visited the Rocky Flats Plant of the Atomic Energy Commission (AEC). The purpose of the visit was to obtain information on liquid radioactive waste management practices at the facility and the environmental surveillance activities in the plant environs. The report presents the findings of the February investigation. The discussion of the environmental levels of plutonium is limited to soil, water, and bottom sediment.

18I. Reactor Engineering and Operation

JPRS-67634 PC$4.50/MF$3.00
Joint Publications Research Service, Arlington, Va.
Selected Soviet Papers Presented at the International Conference on Peaceful Uses of Atomic Energy (4th), Held at Geneva, in 1971.
21 Jul 76, 53p
Trans. from various journals.

Descriptors: *Nuclear engineering, *Meetings, *USSR, Radiation measuring instruments, Power reactors(Nuclear), Waste disposal, Radioactive wastes, Electrodialysis, Translations.

The report contains four reports presented at a 1971 conference on peaceful uses of atomic energy. Report one outlines principles of radiation safety and construction of radiation monitoring systems. Report two discusses the development of the Soviet radiation safety system. Report three discusses radioactive waste disposal by underground burial and discharge into deep formations. Report four outlines the design features and automatic control system of an electrodialysis plant for treating effluent from the Moscow power plant.

PB-257 452/3GA PC$11.00/MF$3.00
Arizona Univ., Tucson. Dept. of Nuclear Engineering.
Dynamic Simulation of a Sodium-Cooled Fast Reactor Power Plant.
Topical rept.,
Mervat Abdel Monem Shinaishin. Aug 76, 413p NUREG-0110
Contract E(11-1)-2548, AT(49-24)-0250

Descriptors: *Nuclear reactor kinetics, *Breeder reactors, Simulation, Mathematical models, Dynamics, Differential equations, Numerical analysis.
Identifiers: SCRAM, Sodium cooled reactors, *Clinch River breeder reactor.

Simulation of the dynamic behavior of the Clinch River Breeder Reactor Plant (CRBRP) is the subject of this dissertation. The range of transients under consideration extends from transients of the type referred to as Anticipated Transient Without Scram (ATWS), to a transient initiated by an unexpected accident followed by reactor scram. This range of transient can be simulated by a digital simulator referred to as the CRBRP ATWS simulator. Two versions of this simulator were prepared; in one, the plant controllers were not included, whereas, in the other, the controllers were incorporated. In addition to the usual assumption of lumped parameters, uniform heat transfer and point kinetics (prompt jump) have been the main approximations in this and other simulators. Two different transport-delay models have also been installed in all simulators. The simulators were constructed using the DARE-P System, developed by the Electrical Engineering Department at The University of Arizona.

PB-257 464/8GA PC$6.00/MF$3.00
Virginia Univ., Charlottesville. School of Engineering and Applied Science.
Bubble Behavior in LMFBR Core Disruptive Accidents.
Annual rept. 1 Jun 75-30 Jun 76,
A. B. Reynolds, C. A. Erdman, P. L. Garner, M. F. Kennedy, and S. P. Rao. Sep 76, 142p NUREG-0114
Contract E(40-1)-4922

Descriptors: *Nuclear reactor accidents, *Radiation hazards, Reactor cores, Bubbles, Aerosols, Mass transfer, Hydrodynamics, Mathematical models, Numerical analysis.
Identifiers: Liquid metal fast breeder reactors.

The work reported here is part of the Aerosol Release and Transport program for LMFBR safety assessment for the Reactor Safety Research Division of the U.S. Nuclear Regulatory Commission. Six areas were at various stages of investigation during this reporting period. A study of nonequilibrium mass transfer during fuel expansion and a study of the dynamics of fuel expansion into the sodium pool were completed. Studies are underway on condensation on above-core structures and on generation of aerosols from condensation. Studies were initiated on small-particle generation from hydrodynamic fragmentation, on particle kinematics and on particle-surface interaction.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A029 265/8GA PC$4.50/MF$3.00
Breed Corp Fairfield N J
Product Improvement to Incorporate a Fluid Immersed Ball Rotor S and A Device in the M550 40mm Dual Purpose Grenade Fuze.
Final rept. 8 Jan-20 Oct 75,
David S. Breed. Nov 75, 50p
Contract DAAA21-75-C-0158
Continuation of Contract DAAA21-74-C-0481.

Descriptors: *Fuze functioning elements, *Safety and arming(Ordnance), *Rotors, Grenade fuzes, Computer aided design, Spin stabilized ammunition.
Identifiers: M-550 fuzes, *Product improvement, Spin armed ammunition.

This is the third in a series of contracts to apply the teachings of a ball rotor computer program to various projectiles. Contract DAAA21-73-C-0650 and follow-on Contract DAAA21-74-C-0481 demonstrated that ball rotor fuze design constructed according to the teachings of a Breed Corporation ball rotor computer program could meet current arming distance criteria for 20MM, 40MM, and 57MM projectiles. This contract was a product improvement program to reduce the cost of a low velocity 40MM fuze, including the requirement to investigate the use of an automatic centering system which would place the ball rotor on the spin axis of the projectile eliminating the effects of shell eccentricity. Shell eccentricity has been found to be one of the causes of erratic ball rotor behavior.

AD-A029 390/2GA PC$3.50/MF$3.00
Explosives Research and Development Establishment Waltham Abbey (England)
The Compatibility of 'Loctite' Sealants with Explosives.
Technical rept.,
N. J. Blay, and E. F. Pembridge. Jan 74, 17p
ERDE-TR-168, DRIC-BR-43689

Descriptors: *Explosives, *Sealants, Adhesives, Compatibility, Double base propellants, High explosives, Pyrotechnics, Plastic explosives, Gun propellants, Anaerobic processes, Acrylic resins, Great Britain.
Identifiers: Loctite.

The explosives compatibility properties of a number of commercially obtainable sealants, marketed under the trade name 'Loctite', are discussed and reported. (Author)

AD-A029 455/3GA PC$5.00/MF$3.00
Picatinny Arsenal Dover N J
Production Control of Acceleration Sensing Devices -- CAM Related.
Technical rept.,
George A. Kelly. Aug 76, 90p Rept no. PA-TR-4821

Descriptors: *Fuze functioning elements, *Production control, Automation, Minicomputers, Safety and arming(Ordnance), Processing equipment, Manufacturing.
Identifiers: *Computer aid manufacturing, *Numerical control.

Current production control of acceleration sensing devices consists, essentially, of functional testing of the completed assemblies. To eliminate the excessive rework and scrap which is common to this system of control, the possibility was explored of assuring quality in the end item by controlling the quality of the components during manufacture. Current literature was searched for process control techniques applicable to the spring mass systems used in

acceleration sensing devices. A concept was subsequently developed which would significantly improve the quality and uniformity of these systems through the use of computer-aided manufacturing techniques. Minicomputers and other recently developed manufacturing equipment, such as on-machine gages, stress-relieving equipment, separators and electronic load testers, were determined to be effective in controlling spring parameters and assuring uniform production. For fuzes which do not require the tight control provided by the minicomputer, the use of a spring separator in combination with an electronic load tester was found to provide a fully automated operation for a minimal investment.

PAT-APPL-587 173/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Injection-Molding Apparatus for Attaching End Fittings to Detonating Cords.
Patent Application,
Allen Howard Smith. Filed 16 Jun 75, 13p AD-D002 866/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Detonating cord, *Fittings, *Injection molding, Sleeves, Hermetic seals, Thermosetting plastics, Molding techniques.
Identifiers: PAT-CL-102-27, *Patent applications.

The patent application relates to a method for attaching a typical end fitting arrangement which includes a sleeve-like bearing member receiving an end of the explosive cord and a coupling member, such as a threaded nut, slipped axially over the cord into a fixed position relative to the sleeve. To securely bind together the cord and the sleeve, a void is provided radially inwardly of the nut and a thermosetting material is directly injected into the void to flow over and around the components. Upon hardening, all components are locked together as an integral body. The injected material further provides a significantly-improved hermetic seal. Special thermosetting materials having short glass fiber fillers are used to assure load-bearing strength.

PAT-APPL-589 482/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Booster Apparatus for Augmenting Side Initiation of Explosive Cords.
Patent Application,
Jacob Savitt, and W. C. Morgan. Filed 23 Jun 75, 11p AD-D002 868/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Detonating cord, *Boosters(Explosives), Fittings, Shock waves, Closures, Propagation.
Identifiers: PAT-CL-102-86.5, *Patent applications.

In the patent application a booster charge is provided with an arcuate, semi-cylindrical surface disposed in continuous contact with a length of explosive cord at a location medial of its length. A donor charge detonates the booster which, in turn, applies the detonation force to a side portion of the explosive cord to produce a cord detonation propagating axially in both directions. Reliability of the cord detonation is increased by the increased amount of the booster charge closely adjacent to the cord and by some focusing of the booster charge. The shock wave propagation in the cord is reliably augmented by the booster. The increased reliability factors permit miniaturization of the donor charge, the booster and the cord.

PATENT-3 965 821 Not available NTIS
Department of the Air Force Washington D C
Low Spin-Deceleration Safing and Arming Mechanism.
Patent,
William O. Maruska. Filed 16 Jan 75, patented 29 Jun 76, 5p AD-D002 854/8, PAT-APPL-541 484
Supersedes AD-D000 421.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fuzes(Ordnance), *Safety and arming(Ordnance), *Patents, Fuze functioning elements, Rotors, Deceleration, Spinning(Motion).
Identifiers: PAT-CL-102-79.

The patent relates to a safing and arming mechanism which is adapted for use with a mechanical fuze, and which is armed only after having been subjected to the combined and total effects of a spin environment. The mechanism includes a rotor and a rotor spring which will arm the mechanism only at a higher static spin rate than a lockweight component of the mechanism. Because of a delay disc-lockweight interlock structural feature, the complete arming sequence of the mechanism is prevented until the necessary spin and deceleration environments exist. When this environmental combination is achieved, the lockweight moves before the rotor can return; and that results in the release of the rotor and the arming of the mechanism.

19D. Explosions, Ballistics, and Armor

AD-A029 223/5GA MF$3.00
Norwegian Defence Research Establishment Kjeller
Investigations of Underground Explosions with Model Tests. Preliminary Report II.
Teknisk notat,
K. G. Schmidt. 2 Apr 76, 49p Rept no. NDRE-VM-238
See also AD-A010 742.
Availability: Microfiche copies only.

Descriptors: *Underground explosions, Ammunition, Storage, Safety, Model tests, Blast waves, Scaling factors, Experimental data, Arrival, Time, Tunnels, Overpressure, Shock waves, Walls, Norway.

A preliminary report describing main results at the present stage of an investigation of underground explosions with model tests in the scale 1/100 and 1/50 is presented. Pressure data and time of arrival data from measurements using the models are given. The results appear as encouraging for the validity of scaling. (Author)

AD-A029 385/2GA PC$4.00/MF$3.00
Southwest Research Inst San Antonio Tex
Preliminary Design of a Suppressive Structure for a Melt-Loading Operation.
Technical rept. no. 7, Jan-Sep 74,
P. A. Cox, and E. D. Esparza. May 76, 27p EM-CR-76028
Contracts DAAD05-74-C-0751, DAAA15-75-C-0083
See also AD-A029 386.

Descriptors: *High explosives, *Manufacturing, *Safety, *Structures, Blast loads, Structural response, Dynamic response, Explosion effects.
Identifiers: *Melt loading, *Suppressive structures.

The report discusses the preliminary design and analyses of a suppressive structure for a melt loading operation having a capacity of 2500 lb of high explosive. The basic structural concept consists of a complete box-shaped steel frame supporting vented panels. The structure is designed to withstand blast loads and fragment impacts.

AD-A029 386/0GA PC$5.00/MF$3.00
Southwest Research Inst San Antonio Tex
Analysis and Preliminary Design of a Suppressive Structure for a Melt Loading Operation.
Technical rept. no. 1, Jan-Mar 74,
W. E. Baker, P. S. Westine, P. A. Cox, and E. D. Esparza. May 76, 93p EM-CR-76056
Contracts DAAD05-74-C-0751, DAAA15-75-C-0083

Descriptors: *High explosives, *Manufacturing, *Safety, *Structures, Blast loads, Structural response, Dynamic response, Explosion effects.
Identifiers: *Melt loading, *Suppressive structures.

This report is the first in a series describing the development of methods for estimating dynamic loading and plastic response of suppressive structures. It covers application to containment of the blast from an accidental explosion in a melt loading operation, and includes preliminary developments of methods to predict blast loads and plastic structural response.

AD-A029 415/7GA PC$5.00/MF$3.00
United States Steel Corp Monroeville Pa Research Lab
Effect of Crystallographic Texture, Retained Austenite, and Austenite Grain Size on the Mechanical and Ballistic Properties of Steel Armor Plates.
Final technical rept. 1 Jul 75-30 Jun 76,
Hsun Hu, G. R. Speich, and R. L. Miller. Jul 76, 76p 76-H-018, AMMRC-CTR-76-22
Contract DAAG46-75-C-0094

Descriptors: *Armor plate, *Armor, *Carbon steels, *Austenite, Steel, Ballistic testing, Hardness, Mechanical properties, Spallation, Heat treatment, Grain size.
Identifiers: Cal .50 projectiles, *Terminal ballistics.

The ballistic performance of a medium-carbon 5Ni-Si-Cu-Mo-V steel processed to plates with various degrees of textures, various amounts of retained austenite, and various austenite grain sizes has been studied. Results show that, with 0.50 caliber projectiles and 0 degree obliquity, the V50 ballistic limit of nearly random-textured plates is around 2030 to 2100 fps (666 to 689 mps), at a hardness of about 53.5 to 54.5 RC. For approximately the same hardness and in-plane mechanical properties, the ballistic limit of strongly (112) + (111) textured plates increased with increasing texture intensity. A ballistic limit of about 2360 fps (774 mps) was observed for the strongest texture produced in plates rolled 80 to 90 percent at 1500 F (815 C) before quenching. With this increased ballistic limit, the tendency for spalling also increased. At a constant strain rate, the spalling resistance appears to correlate qualitatively with the through-thickness notched tensile strength. Tempering quenched plates with a random texture at various high temperatures (1100 to 1300 F or 593 to 704 C) to vary the retained-austenite contents greatly reduced the ballistic limit, primarily because of the lowered hardness. For this range of low hardness and low ballistic limit, the latter increased with increasing retained-austenite contents, but with decreasing hardness.

AD-A029 425/6GA PC$4.00/MF$3.00
Army Mobility Equipment Research and Development Command Fort Belvoir Va
Hypervelocity-Impact Shock-Induced Damage to Steel Armor,
John W. Bond, Jr. Apr 76, 29p Rept no. USAMERDC-2174

Descriptors: *Hypervelocity impact, *Hypervelocity projectiles, *Armor, *Terminal ballistics, Spallation, Impact shock, Damage, Steel, Martensite, Heuristic methods, Theory, Hydrodynamic codes, Fracture(Mechanics), Phase transformations.
Identifiers: Backface spall.

The object of this research was to develop the physics of hypervelocity-impact induced spallation to the extent that small 1-g projectiles can be designed to optimize backface spall in steel armor. Over 100 successful impact experiments and their metallurgical analysis were completed. Some preliminary heuristic spallation theory was developed. The importance of the 130-kbar phase change and adiabatic shear in martensitic steel is discussed. A preliminary conclusion is that such projectiles can be designed; however, more research is needed for optimization. (Author)

AD-A029 435/5GA PC$4.50/MF$3.00
Ballistic Research Labs Aberdeen Proving Ground Md
Turbulent Boundary Layers in Blast Wave and Shock Tube Flows.
Final rept.,
Raymond Sedney, and Clarence W. Kitchens, Jr. Aug 76, 58p Rept no. BRL-1907

Descriptors: *Blast waves, Turbulent boundary layer, *Nuclear explosion simulation, Mathematical prediction, *Explosion effects, Shock tubes, High explosives, Combat vehicles, Vulnerability, Loads(Forces), Mach number, Reynolds number, Fluid dynamics, Surface burst, Surface targets, Mathematical models.
Identifiers: Unsteady flow, Overturning.

An unsteady boundary layer if formed along the ground as a result of nuclear explosions and large HE bursts. This boundary layer influences overturning vulnerability predictions for combat vehicles subjected to blast loading. An integral boundary-layer theory is used to predict the growth of the turbulent boundary layer behind a blast wave. Predictions are presented for conventional and nuclear yields ranging from 18100 kg (20 ton) to 9.07 x 10 to the 8th power kg (1 Mton) TNT equivalent. The boundary-layer growth is calculated using two techniques and compared with experimental boundary-layer measurements taken in a 90700 kg (100 ton) TNT surface tangent sphere explosion. One of the techniques, based on experimentally-derived values for shock position and velocity appears to give a reasonable estimate of the boundary-layer thickness based on the limited experimental data available for comparison. Shock tube simulation of blast wave boundary-layer effects is discussed. Estimates are presented for the growth of the wall boundary layer in the BRL 2.44m (8 ft) shock tube and the boundary layer that can be formed on a ground plane mounted in this shock tube. Testing in the wall boundary layer is not feasible because of balance response-time restrictions. It appears that blast wave boundary layers of moderate thickness, on the order of a meter or less can be simulated using the shock tube ground plane boundary layer. (Author)

19F. Guns

AD-A029 207/8GA PC$4.00/MF$3.00
Watervliet Arsenal N Y
Bearing Evaluations and Sliding Tests on Boride Coatings and Compounds.
Technical rept.,
V. J. Colangelo, and S. F. Murray. Aug 76, 30p Rept no. WVT-TR-76031

Descriptors: *Journal bearings, Sliding friction, *Wear resistance, Steel, Coatings, Borides, *Gun components, Guns, Erosion resistance, Friction, Wear, Vanadium compounds, Molybdenum compounds.

Wear tests, consisting of journal bearing tests and sliding friction tests, were conducted on bonded specimens produced by electrochemical deposition from a fused salt and on specimens made from boride powders (Cr Br2, VB2, and MoB2). Friction values and wear resistance were determined for the specimens. In general, the steels which were borided showed better wear resistance than comparable non-borided steels. No consistent correlation was obtained between crystal structure and sliding performance. (Author)

AD-A029 636/8GA PC$3.50/MF$3.00
Rock Island Arsenal Ill General Thomas J Rodman Lab
M39 Variable Rate/Fire Control Electronics.
Final rept. Nov-Dec 74,
James M. Rohler. Apr 76, 17p Rept no. RIA-R-TR-76-033

Descriptors: *Firing circuits, *Automatic weapons, *Aircraft guns, Helicopters, Firing rates, Control systems.
Identifiers: *M-39 guns(20-mm), Rate control, Fire control systems components.

Design information on the firing circuit by which the firing rate of the M39 20mm automatic gun is controlled is presented. The purpose of the control unit is to separate the variables that have adversely affected successful firing of the M39 gun in the constant recoil mount. (Author)

20. PHYSICS

20A. Acoustics

AD-A029 477/7GA PC$3.50/MF$3.00
Air Force Materials Lab Wright-Patterson AFB Ohio
Electromagnetic Generation of Electronically Steered Ultrasonic Bulk Waves.
Final rept. Sep-Nov 75,
Rodney M. Panos, and T. J. Moran. 17 Nov 75, 8p Rept no. AFML-TR-76-132
Availability: Pub. in Jnl. of Applied Physics, v47 n5 p2225-2227 May 76.

Descriptors: *Ultrasonic radiation, Electroacoustic transducers, Magnetic fields, *Beam steering, Aluminum, Rayleigh waves.
Identifiers: Electromagnetic transducers, Meander lines, Shear waves, Bulk waves, Reprints.

The frequency dependence of the propagation direction of ultrasonic shear and longitudinal waves generated by a meander-line electromagnetic transducer (EMAT) at MHz frequencies has been determined. The results are found to agree well with theory and demonstrate that electronic beam steering is possible using EMAT's. The relative efficiency of generation in aluminum was also studied and, for a specific meander-line geometry with a permanent magnet providing the necessary static magnetic field, it was found to be relatively flat versus frequency. Efficiency for shear-wave generation (frequency range, 5-9 MHz) was about 4 dB per conversion less than the Rayleigh-wave generation efficiency at 4.6 MHz and for longitudinal waves (frequency range, 10-24 MHz) about 100 dB less. (Author)

AD-A029 575/8GA PC$3.50/MF$3.00
Texas Univ At Austin Applied Research Labs
Nonlinear Propagation Distortion of Jet Noise.
Interim rept.,
David T. Blackstock. Nov 75, 12p AFOSR-TR-76-0976
Contract F44620-71-C-0015
Pub. in Proceedings of Interagency Symposium on University Research in Transportation Noise (3rd), Salt Lake City, Utah, 12-14 Nov 75 p1-9 n.d. Sponsored in part by Department of Transportation, Washington, D.C.

Descriptors: *Jet engine noise, *Acoustic fields, Distortion, Sound transmission, Plane waves, Spectrum analysis, Noise pollution, Nonlinear systems, Spectrum signatures.
Identifiers: *Jet noise, Nonlinear acoustics.

A previous theoretical and experimental study of intense broadband noise in a tube showed that propagation distortion is significant for plane waves at sound pressure levels encountered in jet noise fields. A computer program was later modified to account for spherical spreading. In the study reported here, measured noise near actual jets was used as the input for the program. The distortion that is expected to occur during subsequent propagation was computed. Computations were made for noise from a model supersonic jet and from a T38 aircraft. In both cases the computed waveforms exhibit shocks and other evidence of nonlinear effects at moderate distances. However, the model does not include atmospheric attenuation and meteorological effects, ground reflection and absorption, and effects due to the complicated nature of the jet source itself. An outdoor propagation experiment using noise from a conventional sound source is planned for the future.

AD-A029 576/6GA PC$3.50/MF$3.00
Texas Univ At Austin Applied Research Labs
Harmonic Radiations in the Field of a Baffled Piston.
Interim rept.,
T. G. Muir, D. T. Blackstock, J. C. Lockwood, J. G. Willette, and J. A. Shooter. Apr 71, 16p
AFOSR-TR-76-0977
Contract F44620-71-C-0015
Pub. in Proceedings of Specialist Meeting on Non-linear Underwater Acoustics Sponsored by the British Acoustical Society, Birmingham Univ. (England), 1-2 Apr 71 p100-113 1971.

Descriptors: *Underwater sound, *Pistons, *Acoustic emissions, Harmonic analysis, Acoustic attenuation, Waveforms, Acoustic waves, Acoustic fields.
Identifiers: Piston effect.

When the radiation from a baffled piston is sufficiently intense, a number of novel and perhaps useful phenomena related to harmonic generation appear, as a result of nonlinear interactions in the sound field. This paper reports some recent studies of several of the more prominent and interesting of these phenomena; in particular, shock formation, finite amplitude attenuation, and the propagation and directivity of harmonic radiations. Theory pertinent to the delineation of acoustic fields is given, along with the results of several experiments done in a fresh water lake.

AD-A029 577/4GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 3. A-1 Generator Set.
Technical rept.
John N. Cole, Nick A. Farinacci, Robert T. England, Robert Powell, and Henry Mohlman. Jun 75, 58p Rept no. AMRL-TR-75-50-Vol-3
See also Volume 4, AD-A029 578.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, Engine starters, Internal

combustion engines, Internal combustion engine noise, Aerospace systems, Ground support equipment, Aircraft maintenance, Noise(Sound), Tolerances(Physiology), Ground crews, Air Force personnel, Handbooks, Acoustic data.
Identifiers: *Bioenvironmental noise, A-1 Generator sets.

The Air Force Type A-1 Generator Set is a gasoline engine-driven unit used as a source of DC power for ground servicing of aircraft electrical systems and for starting aircraft main propulsion engines. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meterological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance form the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, 'AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 578/2GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 4. MA-1A Power Unit, Gas Turbine Engine (AiResearch).
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jun 75, 66p Rept no. AMRL-TR-75-50-Vol-4
See also Volume 5, AD-A029 579.

Descriptors: *Noise pollution, *Bioacoustics, *Pneumatic devices, *Gas turbines, *Air compressors, *Engine starters, Handbooks, Jet engines, Psychoacoustics, Jet aircraft, Ground support equipment, Noise(Sound), Near field, Far field.
Identifiers: *Bioenvironmental noise, *Pneumatic starters, MA-1A power unit, Pneumatic power.

The MA-1A Power Unit is a turbine engine driven source of pneumatic power for starting aircraft jet engines and furnishing heated pneumatic power to other types of pneumatically operated equipment. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 579/0GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 5. MA-1A Power Unit, Gas Turbine Engine (Continental).
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jun 75, 68p Rept no. AMRL-TR-75-50-Vol-5
See also Volume 6, AD-A029 580.

Descriptors: *Noise pollution, *Bioacoustics, *Air compressors, *Pneumatic devices, *Gas turbines, *Engine starters, Handbooks, Noise(Sound), Jet engines, Jet aircraft, Ground support equipment, Near field, Far field.
Identifiers: *Bioenvironmental noise, *Pneumatic starters, MA-1A power units, Pneumatic power.

The MA-1A Power Unit is a gas turbine driven air compressor for providing the sustained high mass flow necessary to operate pneumatic starters for aircraft jet engines and other pneumatically operated power equipment. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contour for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975. for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 580/8GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 6. A/M32A-60 Generator Set, Power Unit.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jun 75, 58p Rept no. AMRL-TR-75-50-Vol-6
See also Volume 7, AD-A029 581.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, *Gas turbines, Aerospace systems, Ground support equipment, Aircraft maintenance, Noise(Sound), Tolerances(Physiology), Ground crews, Air Force personnel, Handbooks, Acoustic data.
Identifiers: *Bioenvironmental noise, A/M32A-60 generator sets.

The A/M32A-60 Generator Set is a gas turbine engine driven source of AC/DC electrical power with pneumatic capability. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. (Author)

AD-A029 581/6GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 7. MD-3 Generator Set.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jun 75, 62p Rept no. AMRL-TR-75-50-Vol-7
See also Volume 8, AD-A029 582.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, *Engine starters, Aerospace systems, Ground support equipment, Aircraft maintenance, Noise(Sound), Tolerances(Physiology), Ground crews, Air Force personnel, Handbooks, Acoustic data, Portable equipment.
Identifiers: *Bioenvironmental noise, MD-3 generator sets.

The MD-3 Generator Set is a portable unit designed to furnish AC and DC electrical power for the starting of aircraft, and for ground maintenance. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source.

AD-A029 582/4GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 8. C-26-M Generator Set.
Technical rept.,
Nick A. Farinacci, Robert G. Powell, Robert T. England, John N. Cole, and Henry Mohlman. Jun 75, 58p Rept no. AMRL-TR-75-50-Vol-8
See also Volume 9, AD-A029 583.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, *Engine starters, Aerospace systems, Ground support equipment, Aircraft maintenance, Noise(Sound), Tolerances(Physiology), Ground Crews, Air Force personnel, Handbooks, Acoustic data.
Identifiers: *Bioenvironmental noise, C-26-M generator sets.

The C-26-M Generator Set is designed to furnish AC and DC electrical power for ground servicing and for starting aircraft main propulsion engines. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of

physical and psychoacoustic measures: Overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source.

AD-A029 583/2GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook, Volume 9. MC-1M Compressor.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry Mohlman. Jul 75, 58p Rept no. AMRL-TR-75-50-Vol-9
See also Volume 10, AD-A029 584.

Descriptors: *Noise pollution, *Bioacoustics, *Compressor noise, Military aircraft, Ground support equipment, Sound pressure, Intensity, Speech transmission, Interference, Exposure(Physiology), Ear protectors, Field conditions, Handbooks.
Identifiers: *Bioenvironmental noise, MC-1M compressors, Air compressors.

The MC-1M Compressor is a compressor providing a source of high and low pressure for aircraft servicing. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, c-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-Field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10 to 1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this Handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 584/0GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook, Volume 10. MC-11 Air Compressor.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry mohlman. Jul 75, 56p Rept no. AMRL-TR-75-50-Vol-10
See also Volume 11, AD-A029 585.

Descriptors: *Noise pollution, *Bioacoustics, *Compressor noise, Air compressors, Engine starters, Jet aircraft, Ground support equipment, Sound pressure, Intensity, Speech transmission, Interference, Exposure(Physiology), Ear protectors, Field conditions, Handbooks.
Identifiers: *Bioenvironmental noise, MC-11 compressors.

The MC-11 Air compressor is used in starting jet engine-powered aircraft using fuel combustion-type starters and is used for aircraft servicing. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Farfield data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10 to 1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

AD-A029 585/7GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 11. MC-2A Compressor, Rotary, Power Driven.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry Mohlman. Jul 75, 56p Rept no. AMRL-TR-75-50-Vol-11
See also Volume 12, AD-A029 586.

Descriptors: *Noise pollution, *Bioacoustics, *Compressor noise, Air compressors, Compressed air, Ground support equipment, Sound pressure, Intensity, Speech transmission, Interference, Exposure(Physiology), Ear protectors, Field conditions, Handbooks.
Identifiers: *Bioenvironmental noise, MC-2A compressors.

The MC-2A Compressor is a gasoline engine driven, air-cooled air compressor designed to provide a source of low pressure compressed air for general use. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5 to 800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 586/5GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 12. MJ-3 Test Stand, Aircraft Hydraulic System.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry Mohlman. Jul 75, 56p Rept no. AMRL-TR-75-50-Vol-12
See also Volume 13, AD-A029 587.

Descriptors: *Noise pollution, *Bioacoustics, *Air Force personnel, *Acoustic measurement, *Ear protectors, Hydraulic equipment, Ground support equipment, Aircraft equipment, Instrumentation, Data processing, Near field, Test stands, Psychoacoustics.
Identifiers: *Noise levels, *Bioenvironmental noise, Noise handbook, M-J3 test stands.

The MJ-3 Test Stand is a source of hydraulic pressure to simultaneously check or operate three independent hydraulic systems. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10 to 1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 587/3GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 13. MA-1 Manifold Set, Hydraulic Jacking.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry Mohlman. Jul 75, 58p Rept no. AMRL-TR-75-50-Vol-13
See also Volume 14, AD-A029 588.

Descriptors: *Noise pollution, *Bioacoustics, *Hydraulic jacks, Aircraft equipment, Ground support equipment, Psychoacoustics, Acoustic measurement, Far field, Instrumentation, Data processing.
Identifiers: *Bioenvironmental noise, *Noise levels, Hydraulic aircraft jacks, MA-1 manifolds.

The MA-1 Manifold Set is designed to provide a power source for driving hydraulic aircraft jacks. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5 to 800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application', AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement prcedures, instrumentation, data proessing, definitions of

quantities, symbols, equations, applications, limitations, etc.

AD-A029 588/1GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 14. MD-3M Generator Set.
Technical rept.,
Nick A. Farinacci, Robert T. England, Carl G. Toler, John N. Cole, and Henry Mohlman. Jul 75, 60p Rept no. AMRL-TR-75-50-Vol-14
See also Volume 15, AD-A029 589.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, Noise(Sound), Handbooks, Ground support equipment, Engine starters, Sound pressure, Near field, Far field.
Identifiers: *Bioenvironmental noise, MD-3M generator sets.

The MD-3M Generator Set is a portable unit designed to furnish AC and DC electrical power for the starting of aircraft, and for ground maintenance. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: Overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source.

AD-A029 589/9GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 15. MJ-1 Test Stand, Aircraft Hydraulic System.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jul 75, 56p Rept no. AMRL-TR-75-50-Vol-15
See also Volume 16, AD-A029 590.

Descriptors: *Noise pollution, *Bioacoustics, *Air Force personnel, Ear protectors, Hydraulic equipment, Aircraft equipment, Instrumentation, Data processing, Near field, Test stands, Psychoacoustics, Handbooks.
Identifiers: Noise levels, *Bioenvironmental noise, M-J1 Test stands.

The MJ-1 Test Stand is a gasoline engine-driven source of filtered hydraulic pressure designed to test hydraulic systems and individual hydraulic units. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 36 location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meterological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol L: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 590/7GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 16. NF-2 Floodlight Set.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jul 75, 57p Rept no. AMRL-TR-75-50-Vol-16
See also Volume 17, AD-A029 591.

Descriptors: *Noise pollution, *Bioacoustics, *Floodlights, Aerospace systems, Ground support equipment, Aircraft maintenance, Noise(Sound), Tolerances(Physiology), Ground Crews, Air Force Personnel, Handbooks, Acoustic data.
Identifiers: *Bioenvironmental noise, NF-2 floodlights.

The NF-2 Floodlight Set provides portable floodlighting facilities for aircraft maintenance on ramps where commercial power is not available, or for utilization as emergency lighting in disaster areas. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source.

AD-A029 591/5GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 17. MC-1 Compressor, Reciprocating, Power Driven.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Jul 75, 57p Rept no. AMRL-TR-75-50-Vol-17
See also Volume 18, AD-A029 592.

Descriptors: *Noise pollution, *Bioacoustics, *Air compressors, *Acoustic measurement, *Compressor noise, *Ear protectors, Air Force personnel, Aircraft maintenance, Ground support equipment, Reciprocating pumps, Near field, Handbooks, Psychoacoustics.
Identifiers: *Bioenvironmental noise, Reciprocating compressors, MC-1 Compressors, *Noise levels.

The MC-1 Compressor is an engine-driven air compressor designed to furnish a source of high and low pressure air for aircraft servicing. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 592/3GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 18. A/E 24U-8 Power Plant, Electric, Gas Turbine.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole , and Henry Mohlman. Jul 75, 56p Rept no. AMRL-TR-75-50-Vol-18
See also Volume 19, AD-A029 593.

Descriptors: *Noise pollution, *Bioacoustics, *Electric power plants, *Motor generators, *Gas turbines, Aerospace systems, Ground support equipment, Noise(Sound), Tolerances(Physiology), Ground crews, Air force personnel, Handbooks, Acoustic data.
Identifiers: *Bioengineering noise, A/E 24U-8 Power plants, 407L Program.

The A/E24U-8 Power Plant supplies precise power for 3-D radar, computers and communications for the Tactical Command System 407L. This unit includes tow generator sets (EMU-30E) which can be operated singly or in parallel. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 38 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. (Author)

AD-A029 593/1GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 19. BT400-10 Heater, Engine and Shelter, Type H-1.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 59p Rept no. AMRL-TR-75-50-Vol-19
See also Volume 20, AD-A029 594.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft heaters, *Airplane engine heaters, Ground support equipment, Handbooks, Noise, Heating, Aircraft engines, Aircraft cabins, Cockpits, Shelters, Aerospace systems, Measurement, Near field, Far field, Psychoacoustics, Aviation medicine, Aviation safety, Tables(Data).
Identifiers: *Bioenvironmental noise, *H-1 heaters.

The BT400-10 Heater, Type H-1 is a self-contained gasoline burning heating unit designed to preheat aircraft engines, cockpits and cabins. This report provides measured and ex-

trapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol. 1: Organization, Content and Application, 'AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 594/9GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 20. MJ-2A Test Stand, Aircraft Hydraulic System - Gasoline Engine Driven.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 54p Rept no. AMRL-TR-75-50-Vol-20
See also Volume 21, AD-A029 595.

Descriptors: *Noise pollution, *Bioacoustics, Test stands, *Hydraulic equipment, *Internal combustion engines, Ground support equipment, Handbooks, Noise, Measurement, Near field, Far field, Psychoacoustics, Aviation medicine, Aviation safety, Aerospace systems, Speech, Interference, Tables(Data).
Identifiers: *Bioenvironmental noise, *MJ-2A Test stand.

The MJ-2A Test Stand is a gasoline engine-driven source of filtered hydraulic pressure designed to test hydraulic systems and individual hydraulic units and to pressurize aircraft hydraulic reservoirs. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 595/6GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 21. MB-1 Tester, Pressurized Leakage Cabin Aircraft.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 56p Rept no. AMRL-TR-75-50-Vol-21
See also Volume 22, AD-A029 596.

Descriptors: *Noise pollution, *Bioacoustics, *Internal combustion engines, *Pneumatic devices, Ground support equipment, Handbooks, Noise, Measurement, Test equipment, Near field, Far field, Psychoacoustics, Aviation medicine, Aviation safety, Aerospace systems, Leakage, Test methods, Speech, Interference, Tables(Data).
Identifiers: *Bioenvironmental noise, *MB-1 Testers.

The MB-1 Tester is a gasoline engine driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 596/4GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 22. PU286 (JHGW5A) Generator Set.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 54p Rept no. AMRL-TR-75-50-Vol-22
See also Volume 23, AD-A029 597.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, Handbooks, Noise(Sound), Near field, Sound pressure, Far field, Exposure(Physiology), Gasoline, Portable equipment, Speech, Interference, Ground support equipment, Ear protectors.
Identifiers: *Bioenvironmental noise, PU286 Generator sets, Speech interference.

The PU286 Generator Set is a gasoline engine driven portable unit designed to furnish electrical power for genral purposes. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 597/2GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 23. MJ-1 Truck, Bomb Service.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 54p Rept no. AMRL-TR-75-50-Vol-23
See also Volume 24, AD-A029 598.

Descriptors: *Noise pollution, *Bioacoustics, *Bomb trucks, Ear protectors, Acoustic measurement, Handbooks, Air Force personnel, Bomb hoists, Bomb handling vehicles, Instrumentation, Data processing.
Identifiers: Bioenvironmental noise, Noise levels, MJ-1 Trucks, MJ-1 Bomb trucks.

The MJ-1 Bomb Lift Truck is designed to lift, carry, and attach externally-carried munitions, pylons and fuel tanks onto fighter type aircarft. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 38 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-Weighted sound levels, preferred speech interference level perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 598/0GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 24. EMU-10/U Generator Set, Gasoline Engine Driven.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 56p Rept no. AMRL-TR-75-50-Vol-24
See also Volume 25, AD-A029 599.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, Handbooks, Noise(Sound), Ground support equipment, Alternating current, Near field, Far field, Sound pressure, Gasoline.
Identifiers: *Bioenvironmental noise, EMU-10/U Generator sets, Speech interference.

The EMU-10/U Generator Set is a source of precise 60 cycle AC power and is designed to support communications electronics and radar. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors

on a concrete apron at normal rated/loaded conditions. Nearafield data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equation, applications, limitations, etc. (Author)

AD-A029 599/8GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 25. MA-7 Electronic Air Conditioner.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 54p Rept no. AMRL-TR-75-50-Vol-25
See also Volume 26, AD-A029 600.

Descriptors: *Noise pollution, *Bioacoustics, *Air conditioning equipment, Electronic equipment, Jet aircraft, Handbooks, Noise(Sound), Guided missiles, Ground support equipment, Psychoacoustics, Ear protectors, Near field, Far field, Sound pressure.
Identifiers: *Bioenvironmental noise, MA-7 electronic air conditioners.

The MA-7 Electronic Air Conditioner is an engine-driven air conditioner designed to cool electronic equipment on jet aircraft and missiles during field servicing and preflighting. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 600/4GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 26. MA-3 Air Conditioner.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 56p Rept no. AMRL-TR-75-50-Vol-26
See also Volume 27, AD-A029 601.

Descriptors: *Noise pollution, *Bioacoustics, *Air conditioning equipment, Noise(Sound), Handbooks, Ground support equipment, Sound pressure, Psychoacoustics.
Identifiers: *Bioenvironmental noise, MA-3 air conditioners.

The MA-3 Air Conditioner is an engine-driven air conditioner designed to provide conditioned air to the aircraft's interior during ground servicing. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Farfield data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source.

AD-A029 601/2GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 27. D-5 Test Stand, Aircraft Hydraulic System.
Technical rept.,
Nick A. Farinacci, John N. Cole, Robert T. England, Robert G. Powell, and Henry Mohlman. Aug 75, 58p Rept no. AMRL-TR-75-50-Vol-27
See also Volume 28, AD-A029 602.

Descriptors: *Noise pollution, *Bioacoustics, Test stands, *Hydraulic equipment, *Internal combustion engines, Ground support equipment, Handbooks, Near field, Far field, Psychoacoustics, Aviation medicine, Aviation safety, Aerospace systems, Tables(Data), Measurement, Speech, Interference.
Identifiers: *Bioenvironmental noise, D-5 Test stands.

The D-5 Hydraulic Test Stand is a gasoline engine-driven unit designed to test aircraft hydraulic systems. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance form the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitation, etc. (Author)

AD-A029 602/0GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 28. MC-1A Compressor, Reciprocating, Power Driven.
Technical rept.,
Nick A. Farinacci, John N. Cole, Robert T. England, Robert G. Powell, and Henry Mohlman. Aug 75, 58p Rept no. AMRL-TR-75-50-Vol-28
See also Volume 29, AD-A029 603.

Descriptors: *Noise pollution, *Bioacoustics, *Compressor noise, Acoustic measurement, *Air compressors, Ear protectors, Air Force personnel, Aircraft maintenance, Ground support equipment, Reciprocating pumps, Near field, Handbooks, Psychoacoustics.
Identifiers: *Bioenvironmental noise, Reciprocating compressors, MC-1A compressors, *Noise levels.

The MC-1A Compressor is an engine-driven air compressor designed to furnish a source of high and low pressure for aircraft servicing. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 5-800 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 603/8GA PC$4.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 29. MJ-4 Truck, Bomb Service.
Technical rept.,
Nick A. Farinacci, Robert T. England, Robert G. Powell, John N. Cole, and Henry Mohlman. Aug 75, 58p Rept no. AMRL-TR-75-50-Vol-29
See also Volume 30, AD-A029 604.

Descriptors: *Noise pollution, *Bioacoustics, *Bomb trucks, Acoustic measurement, Ear protectors, Air force personnel, Handbooks, Bomb hoists, Bomb handling vehicles, Psychoacoustics, Instrumentation, Data processing.
Identifiers: *Bioenvironmental noise, MJ-4 Trucks, MJ-4 Bomb trucks, *Noise levels.

The MJ-4 Bomb Lift Truck is designed to lift, carr, and attach externally-carried munitions, pylons and fuel tanks onto fighter type aircraft. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Near-field data are reported for 38 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorologic conditions and extrapolated from 5-800 meters to derive

sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, application, limitations, etc. (Author)

AD-A029 604/6GA PC$4.00/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 30. MD-3A Generator Set.
Technical rept.,
Nick A. Farinacci, Robert T. England, John N. Cole, Henry Mohlman, and David Eilerman. Aug 75, 46p Rept no. AMRL-TR-75-50-Vol-30
See also Volume 31, AD-A029 605.

Descriptors: *Noise pollution, *Bioacoustics, *Motor generators, Noise(Sound), Handbooks, Ground support equipment, Engine starters, Sound pressure.
Identifiers: *Bioenvironmental noise, MD-3A generator sets.

The MD-3A Generator Set is a portable unit designed to furnish AC and DC current for starting aircraft, for ground maintenance, and for servicing and calibrating instruments. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated/loaded conditions. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10-1600 meters to derive sets of equal-value contours as functions of angle and distance from the source for a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 605/3GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 31. B-52H In-Flight Crew Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 16p
Rept no. AMRL-TR-75-50-Vol-31
See also Volume 32, AD-A029 606.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Inflight, Noise(Sound), *Bomber aircraft, Sound pressure, Interference, Exposure(Physiology), Ear protectors, Voice communications.
Identifiers: *Bioenvironmental noise, B-52 aircraft, B-52H aircraft.

The B-52H is a USAF strategic heavy bomber aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 9 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 606/1GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 32. KC-135A In-Flight Crew Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 25p
Rept no. AMRL-TR-75-50-Vol-32
See also Volume 33, AD-A029 607.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Inflight, Noise(Sound), Sound pressure, Interference, Exposure(Physiology), Ear protectors, Voice communications, Transport aircraft, *Tanker planes.
Identifiers: *Bioenvironmental noise, KC-135 aircraft, C-135 aircraft.

The KC-135A is the standard USAF tanker-transport aircraft with high-speed high-altitude refueling and long-range transport capability. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 15 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 607/9GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 33. C-131B In-Flight Crew Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 13p
Rept no. AMRL-TR-75-50-Vol-3
See also Volume 34, AD-A029 608.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Inflight, Noise(Sound), Sound pressure, Interference, Exposure(Physiology), Ear protectors, Voice communications, *Transport aircraft, Passenger aircraft.
Identifiers: *Bioenvironmental noise, C-131 aircraft, C-131B aircraft.

The C-131B is a USAF transreport/passenger aircraft which can be used as a flying laboratory. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 9 locations in a wide variety of physical and psychoacoustic measures: overall, and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total exposure of personnel with and without standard Air Force ear protectors.

AD-A029 608/7GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 34. VC-118A In-Flight Crew/Passenger Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 22p
Rept no. AMRL-TR-75-50-Vol-34
See also Volume 34, AD-A029 609.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Noise(Sound), Inflight, Sound pressure, Interference, Exposure(Physiology), Ear protectors, Voice communications, *Passenger aircraft, Transport aircraft, Passengers.
Identifiers: *Bioenvironmental noise, VC-118A aircraft, VC-118 aircraft.

The VC-118A is a USAF passenger aircraft with cargo transport capability. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 24 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 609/5GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 35. T-39B In-Flight Crew/Passenger Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 15p
Rept no. AMRL-TR-75-50-Vol-35
See also Volume 37, AD-A029 610.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Passengers, Sound pressure, Noise(Sound), Interference, Exposure(Physiology), Ear protectors, Voice communications, Utility aircraft, *Training planes.
Identifiers: *Bioenvironmental noise, T-39 aircraft, T-39B aircraft.

The T-39B is a USAF combat readiness trainer and utility aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 4 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 610/3GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 37. F-4D In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David F. Eilerman. Sep 75, 15p Rept no. AMRL-TR-75-50-Vol-37
See also Volume 38, AD-A029 611.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Inflight, Noise(Sound), Voice communications, *Fighter bombers, Sound pressure, Interference, Exposure(Physiology), Ear protectors.
Identifiers: *Bioenvironmental noise, F-4 aircraft, F-4D aircraft.

The F-4D is a USAF long-range, all-weather attack fighter-bomber aircraft. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported 1 location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 611/1GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio

USAF Bioenvironmental Noise Data Handbook. Volume 38. C-130E In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 18p Rept no. AMRL-TR-75-50-Vol-38
See also Volume 39, AD-A029 612.

Descriptors: *Noise pollution, *Bioacoustics, Flight crews, Noise(Sound), *Transport aircraft, Sound pressure, Interference, Ear protectors, Inflight, Voice communications, Humans, Exposure(Physiology).
Identifiers: *Bioenvironmental noise, C-130 aircraft, *Aircraft noise.

The C-130E is a USAF tactical long-range combat transport aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 9 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 612/9GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook. Volume 39. UH-1F In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci , John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 12p Rept no. AMRL-TR-75-50-Vol-39
See also Volume 42, AD-A029 613.

Descriptors: *Noise pollution, *Bioacoustics, Flight crews, Inflight, Utility aircraft, *Helicopters, Noise(Sound), Voice communications, Sound pressure, Interference, Exposure(Physiology), Ear protectors.
Identifiers: *Bioenvironmental noise, UH-1 aircraft, UH-1F aircraft, *Aircraft noise.

The UH-1F is a USAF general-purpose utility helicopter providing transportation to and from remote missile installations. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for 1 location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 613/7GA PC$4.00/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 42. EC-135H In-Flight Crew Noise.
Technical rept.,
Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Oct 75, 28p Rept no. AMRL-TR-75-50-Vol-42
See also Volume 45, AD-A029 614.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Interference, Speech transmission, Sound pressure, Ear protectors, Exposure(Physiology), *Reconnaissance aircraft.
Identifiers: *Bioenvironmental noise, EC-135 aircraft, EC-135H aircraft, *Electronic aircraft.

The EC-135H is a modified KC-135A aircraft equipped as an airborne command post for use by Hq USAF (Night Watch). This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 36 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 614/5GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 45. F-111E In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr. , Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Oct 75, 15p Rept no. AMRL-TR-75-50-Vol-45
See also Volume 46, AD-A029 615.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Sound pressure, Speech transmission, Interference, Ear protectors, Exposure(Physiology), Supersonic aircraft, *Fighter bombers, Tactical aircraft.
Identifiers: *Bioenvironmental noise, F-111 aircraft, F-111E aircraft.

The F-111E is a USAF two-seat, all-weather supersonic tactical fighter-bomber with an automatic low-altitude terrain following capability. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 615/2GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 46. O-2A In-Flight Crew Noise.
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Oct 75, 12p Rept no. AMRL-TR-75-50-Vol-46
See also Volume 47, AD-A029 616.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Interference, Speech transmission, Sound pressure, Ear protectors, Exposure(Physiology), Observation aircraft, Utility aircraft.
Identifiers: *Bioenvironmental noise, O-2 airecraft, O-2A aircraft, Forward area air defense systems.

The O-2A is a USAF forward air-control aircraft with additional capability for light cargo and administrative transport type missions. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations, Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 616/0GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 47. O-2B In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Henry Mohlman, Nick A. Farinacci, David Eilerman, and John N. Cole. Oct 75, 15p Rept no. AMRL-TR-75-50-Vol-47
See also Volume 48, AD-A029 617.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Sound pressure, Ear protectors, Speech transmission, Interference, Exposure(Physiology), Utility aircraft, *Observation aircraft.
Identifiers: *Bioenvironmental noise, O-2 aircraft, O-2B aircraft.

The O-2B is a USAF airborne psychological warfare aircraft, with additional capability for light cargo, liaison, and administrative transport type missions. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported for two locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 617/8GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 48. T-33A In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Henry Mohlman, Nick A. Farinacci, John N. Cole, and David Eilerman. Oct 75, 15p Rept no. AMRL-TR-75-50-Vol-48
See also Volume 49, AD-A029 618.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Sound pressure, Inflight, Flight crews, Interference, Speech transmission, Exposure(Physiology), *Training planes, Ear protectors, Jet aircraft.
Identifiers: *Bioenvironmental noise, T-33 aircraft, T-33A aircraft, *Jet training planes.

The T-33A is a USAF basic jet training aircraft used for pilot transition to turbojet fighter aircraft and for pilot proficiency training. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 618/6GA PC$4.00/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 49. T-34A In-flight Crew Noise.
Technical rept.,
Nick A. Farinacci, David Eilerman, John N. Cole, and Henry Mohlman. Oct 75, 43p Rept no. AMRL-TR-75-50-Vol-49
See also Volume 50, AD-A029 619.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Flight crews, Inflight, Noise(Sound), Sound pressure, Speech transmission, Interference, Ear protectors, Exposure(Physiology), *Training planes.
Identifiers: *Bioenvironmental noise, T-43 Aircraft, T-43A Aircraft, *Jet training planes.

The T-43A is a USAF subsonic navigational trainer aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 26 locations in a wide variety of

physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 619/4GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 50. HH-43B In-flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Oct 75, 15p Rept no. AMRL-TR-75-50-Vol-50
See also Volume 51, AD-A029 620.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Noise(Sound), Sound pressure, Speech transmission, Interference, Ear protectors, Exposure(Physiology), *Helicopters, Rescue vehicles.
Identifiers: *Bioenvironmental noise, HH-43 aircraft, HH-43B aircraft, Rescue aircraft.

The HH-43B is a USAF local crash rescue helicopter used for fire control and suppression, and aerial/crash-entry pickup of survivors. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for three locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 620/2GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 51. HH-53C In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Oct 75, 15p Rept no. AMRL-TR-75-50-Vol-51
See also Volume 52, AD-A029 621.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Helicopters, Flight crews, Noise(Sound), Handbooks, Sound pressure, Inflight, Amphibious aircraft, Search and rescue, Speech, Interference.
Identifiers: *Bioenvironmental noise, HH-53C aircraft, H-53 aircraft, Speech interference.

THe HH-53C is a USAF heavy assault transport helicopter used to search, locate, and recover combat aircrew members, personnel, and/or vital aerospace hardware. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for 15 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to VOlume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 621/0GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 52. A-1E In-flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 15p Rept no. AMRL-TR-75-50-Vol-52
See also Volume 53, AD-A029 622.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Noise(Sound), Sound pressure, Interference, Exposure(Physiology), Ear protectors, Voice communications, *Bomber aircraft, Utility aircraft.
Identifiers: *Bioenvironmental noise, A-1 aircraft, A-1E aircraft, *Attack bombers.

The A-1E is a USAF light attack bomber or utility aircraft used in counter-insurgency operations. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 622/8GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 53. AC-119G In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 13p Rept no. AMRL-TR-75-50-Vol-53
See also Volume 54, AD-A029 623.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Gunships, Flight crews, Passengers, Sound pressure, Intensity, Speech transmission, Interference, Exposure(Physiology), Ear protectors, Inflight, Handbooks.
Identifiers: *Bioenvironmental noise, AC-119G aircraft, C-119 aircraft, *Helicopters.

The AC-119G is a USAF gunship for interdiction and suppression of enemy ground attack. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 6 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Applications', AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 623/6GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 54. C-123K In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Sep 75, 24p Rept no. AMRL-TR-75-50-Vol-54
See also Volume 55, AD-A029 624.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Transport aircraft, Flight crews, Passengers, Sound pressure, Intensity, Speech transmission, Interference, Ear protectors, Exposure(Physiology), Inflight, Handbooks.
Identifiers: *Bioenvironmental noise, C-123K aircraft.

The C-123K is a USAF medium assault cargo aircraft used as a troop transport and cargo carrier with STOL capability. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 13 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application', AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 624/4GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 55. AC-130A In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 13p Rept no. AMRL-TR-75-50-Vol-55
See also Volume 56, AD-A029 625.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Transport aircraft, Sound pressure, Intensity, Flight crews, Passengers, Speech Transmission, Interference, Exposure(Physiology), Inflight, Handbooks.
Identifiers: *Bioenvironmental noise, AC-130A aircraft, C-130 aircraft, *Close support aircraft.

The AC-130A is a USAF close-support conversion of the C-130A medium-range combat transport aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 15 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, perferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors, Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application', AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 625/1GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 56. HC-130N In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 21p Rept no. AMRL-TR-75-50-Vol-56
See also Volume 57, AD-A029 626.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Noise(Sound), Sound pressure, Interference, Exposure(Physiology), Ear protectors, Speech transmission, *Tanker planes, Rescue vehicles, Transport aircraft.
Identifiers: *Bioenvironmental noise, HC-130 aircraft, HC-130N aircraft.

The HC-130N is a USAF aircraft used to search for, locate and recover personnel and/or retrieve material in global air and space operations; it also serves as an air refueling tanker for helicopters. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 14 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 626/9GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 57. T-28D-5 In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 15p Rept no. AMRL-TR-75-50-Vol-57
See also Volume 60, AD-A029 627.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Inflight, Flight crews, Noise(Sound), Sound pressure, Interference, Exposure(Physiology), *Reconnaissance aircraft, Ear protectors, Speech transmission, Close support.
Identifiers: *Bioenvironmental noise, T-28 aircraft, T-28D-5 aircraft, *Close support aircraft.

The T-28D-5 is a USAF light armed reconnaissance and close air support aircraft used for counter-insurgency operations. This report provides measured data defining the bioacoustic environments at flight crew locations inside this aircraft during normal flight operations. Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors.

AD-A029 627/7GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 60. UH-1N In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 15p Rept no. AMRL-TR-75-50-Vol-60
See also Volume 61, AD-A029 628.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Helicopters, Flight crews, Handbooks, Noise(Sound), Gunships, Inflight, Ear protectors, Interference, Sound pressure, Speech, Exposure(Physiology).
Identifiers: *Bioenvironmental noise, UH-1N aircraft, H-1 aircraft, Speech interference.

The UH-1N is a USAF Utility Helicopter configured as a gunship. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for one location in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 628/5GA PC$3.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 61. HH-3E In-Flight Crew Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 15p Rept no. AMRL-TR-75-50-Vol-61
See also VOlume 62, AD-029 629.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, *Helicopters, Flight crews, Handbooks, Noise(Sound), Amphibious aircraft, Search and rescue, Inflight, Interference, Sound pressure, Speech, Exposure(Physiology).
Identifiers: *Bioenvironmental noise, HH-3E aircraft, H-3 aircraft, Speech interference.

The HH-3E is a USAF amphibious transport helicopter used for search and rescue, and combat aircrew recovery. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for seven locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference levels, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 629/3GA PC$4.00/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 62. C-5A In-flight Crew/Passenger Noise.
Technical rept.,
Justus F. Rose, Jr., Nick A. Farinacci, John N. Cole, Henry Mohlman, and David Eilerman. Nov 75, 30p Rept no. AMRL-TR-75-50-Vol-62
See also Volume 63, AD-A029 630.

Descriptors: *Noise pollution, *Bioacoustics, *Aircraft noise, Turbofan engines, *Jet transport planes, Flight crews, Passengers, Sound pressure, Intensity, Speech transmission, Interference, Ear protectors, Exposure(Physiology), Inflight, Handbooks.
Identifiers: *Bioenvironmental noise, C-5A Aircraft, C-5 Aircraft

The C-5A is a USAF heavy logistics transport aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 66 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application', AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

AD-A029 630/1GA PC$7.50/MF$3.00
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
USAF Bioenvironmental Noise Data Handbook: Volume 63. F-15A Aircraft, Near and Far-Field Noise.
Technical rept.,
Robert G. Powell, John N.Cole, Nick A. Farinacci, Jerry Speakman, and Henry Mohlman. Nov 75, 185p Rept no. AMRL-TR-75-50-Vol-63
See also Volume 3, AD-A029 577.

Descriptors: *Noise pollution, *Bioacoustics, *Engine starters, *Turbofan engines, *Jet engine noise, Handbooks, Noise, Measurement, Landing fields, Jet fighters, Aircraft noise, Speech, Interference, Aviation medicine, Aviation safety, Near field, Far field.
Identifiers: *Bioenvironmental noise, F-15A aircraft.

The USAF F-15A aircraft is an air superiority fighter powered by two F100-PW-100(1) turbofan engines and with an on-board jet engine (jet fuel starter, JFS) used to start the turbofan engine. The report provides measured and extrapolated data defining the bioacoustic environments produced by this aircraft operating on a concrete runup pad for seven engine/JFS power configurations. Near-field data are reported for 10 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 19 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application', AMRL-TR-75-50(1) 1975, for discussion of the Objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. (Author)

20B. Crystallography

PB-256 862/4GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Orientation of Hexagonal Crystals.
Final rept.,
D. R. Winder. 30 Dec 68, 10p
Pub. in American Jnl. of Physics, v38 n3 p319-326 Mar 70.

Descriptors: *Crystal structure, *Orientation, *Hexagonal lattices, Graphs(Charts), Lattice parameters, X ray diffraction.
Identifiers: Reprints.

Interplanar angles and stereographic projections are described for hexagonal structures. Graphs of the variations of some interplanar angles with c/a are given. The four systems of indexing hexagonal lattices are compared.

20C. Electricity and Magnetism

AD-A029 302/7GA PC$3.50/MF$3.00
Cornell Univ Ithaca N Y School of Applied and Engineering Physics
Current-Phase Relations as Determinants of Superconducting Thin-Film Weak-Link I-V Characteristics.
Technical rept.,
L. D. Jackel, W. H. Henkels, J. M. Warlaumont, and R. A. Buhrman. 29 Mar 76, 4p Rept nos. TR-2, MSC-2665
Contract N00014-76-C-0526
Prepared in cooperation with Bell Telephone Labs., Holmdel, N. J. and IBM Watson Lab., Yorktown Heights, N. Y.
Availability: Pub. in Applied Physics Letters, v29 n3 p214-216, 1 Aug 76.

Descriptors: *Superconductivity, *Superconductors, Thin films, Tin, Gold, Direct current, Phase measurement, Reprints.
Identifiers: *Superconducting weak links.

The dc I-V characteristics of superconducting thin-film Sn-Au proximity bridges and uniform-thickness Sn microbridges have been carefully analyzed as a function of the directly measured current-phase relation (CPR). At sufficiently low dc current and voltage levels where heating and relaxation time effects are not important, the I-V characteristics are very well described by a shunted weak-link model that includes the proper dc CPR and a shunt resistance. (Author)

AD-A029 403/3GA PC$5.00/MF$3.00
Informatics Inc Rockville Md
Bibliography of Soviet Developments in Superconductivity, January 1975 - June 1976,
John Kourilo, and Stuart G. Hibben. 31 Aug 76, 87p
Contract MDA903-76-C-0099, ARPA Order-3097

Descriptors: *Superconductivity, *Bibliographies, *USSR, *Superconductors, Josephson junctions, Cryogenics, Magnets, Power, Niobium alloys, Scientific research.
Identifiers: Soviet bloc.

This is a bibliography of recent Soviet-bloc publications on the subject of superconductivity, covering the period of January, 1975 through June, 1976. The citations are taken from open-source literature received at the Informatics library during this interval. (Author)

AD-A029 566/7GA Not available NTIS
American Inst of Physics New York
Magnetism and Magnetic Materials-1974. Annual Conference (20th) Held at San Francisco, Calif., December 3-6, 1974,
C. D. Graham, Jr., G. H. Lander, and J. J. Rhyne. 1975, 814p Rept no. AIP-Conference Proceedings-24
Grant Nonr(G)-0004-74
Availability: American Institute of Physics, 335 East 45th St., New York, N. Y. 10017. No copies furnished by DDC/NTIS.

Descriptors: *Magnetic materials, *Magnets, Magnetic recording systems, Bubble memories, Metals, Alloys, Rare earth compounds, Amorphous materials, Symposia, Conferences.

No abstract available.

AD-A029 567/5GA Not available NTIS
American Inst of Physics New York
Magnetism and Magnetic Materials-1975. Annual Conference (21st) Held at Philadelphia, Pa., December 9-12, 1975,
J. J. Becker, G. H. Lander, and J. J. Rhyne. 1976, 714p Rept no. AIP-Conference Proceedings-29
Grant N00014-76-G-0006
Availability: American Institute of Physics, 335 East 45th ST., New York, N. Y. 10017. No copies furnished by DDC/NTIS.

Descriptors: *Magnetic materials, *Magnets, Bubble memories, Magnetic recording systems, Metals, Alloys, Symposia, Conferences, Magnetic cores, Amorphous materials.
Identifiers: *Magnetism.

This volume comprises the permanent record of the 21st Annual Conference on Magnetism and Magnetic Materials, held in Philadelphia December 9-12, 1975. In it approximately 350 speakers, contributing and invited, have set down their principal argument and conclusions.

20D. Fluid Mechanics

AD-A029 144/3GA PC$5.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Aerodynamic Load Characteristics of Six 0.05-Scale Stores in the Flow Field of an F-4C Aircraft at Mach Numbers from 0.5 to 1.1.
Final rept. for period ending 20 Nov 75,
G. R. Gomillion. Aug 76, 78p AEDC-TR-76-45, AFATL-TR-76-36
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-PWT-TR-76-12.

Descriptors: *External stores, *Aerodynamic loading, Jet fighters, Aerodynamic configurations, Blunt bodies, Conical bodies, Afterbodies, Hemispheres, Noses, Cylindrical bodies, Fins, Aerodynamics, Free stream, Flow fields, Mach number, Scale models.
Identifiers: F-4C Aircraft, F-4 Aircraft.

Wind-tunnel tests were conducted using six 0.05-scale stores with various afterbody shapes to investigate the store aerodynamic load characteristics in the flow field of the F-4C aircraft. The store models had a hemispherical nose and a cylindrical midsection with various afterbody shapes. Three store models had cruciform pattern fins on a blunted cone-shaped afterbody. The other three store models had blunted cone, blunted ogive, and cylindrical-shaped afterbodies, respectively. All finned store models were tested in both 'X' and '+' fin orientations. Free-Stream store loads data were also obtained at yaw angles between -6 and 30 deg. All store loads data are presented for Mach numbers from 0.5 to 1.1. (Author)

AD-A029 221/9GA PC$3.50/MF$3.00
Johns Hopkins Univ Baltimore Md
Applications of Mixing Experiments to Estuaries,
Robert R. Long. 12 Jun 75, 22p
Contract N00014-75-C-0805
Proceedings of the Specialty Conference on Civil Engineering in the Oceans/III, held at Newark, Del., 9-12 Jun 75.

Descriptors: *Fluid flow, *Estuaries, *Fjords, Turbulent flow, Deep water, Hydrodynamics, Salt water, Fresh water, Mixing, Velocity, Density, Friction, Layers, Equations of motion, Experimental data.
Identifiers: Halocline, Critical flow.

The paper considers estuarine circulations in deep, two-layer, fjord-type estuaries. The first part of the discussion ignores the details of the mass distribution and the circulations in the main body of the estuary (except for a calculation of the depth of the halocline) and concentrates on the flow conditions and interface depth in the vicinity of the mouth. The flow near the mouth is considered to be frictionless and the pressure hydrostatic, and the first part of the analysis, which assumes strong mixing (and, therefore, a deep halocline) in the estuary yields the same results as those of Stommel and Farmer for an 'overmixed' state. Phenomena in this state are functions of a non-dimensional number Q, proportional to the fresh water influx q sub f. The second discussion presents a complete solution for flow conditions and mass distributions in a deep, two-layer rectangular estuary. Mixing occurs across the interface and friction is a dominant factor. The interface slopes downward toward the mouth reaching a maximum depth at a certain section. Beyond this the interface rises. At the mouth where, by definition, the width of the estuary increases rapidly, it is found that there must be a transition from subcritical to supercritical flow. The solution is determined by the fresh-water influx per unit width, the rms turbulent velocity, the estuary length and the buoyancy of sea water and has a reasonable behavior for variations of these parameters. A basic feature for fjord-type estuaries is the dominance of friction.

AD-A029 231/8GA PC$4.00/MF$3.00
Science Applications Inc La Jolla Calif
SKIMMER - A Numerical Model for Nonlinear Waves.
Final rept. Oct 73-Jan 76,
G. T. Phillips, and R. K.-C. Chan. 27 Aug 76, 43p
Rept no. SAI-76-605-LJ
Contract N00014-74-C-0118

Descriptors: *Planing surfaces, *Surface waves, Water waves, Nonlinear systems, Mathematical models, Computer programs, Computerized simulation, Sheets, Numerical methods and procedures, Boundary value problems, Navier Stokes equations, Inviscid flow, Flow fields, Pressure, Time, Hydrodynamics.
Identifiers: *Skimmer model, Nonlinear waves.

The calculation of nonlinear free surface waves produced by a moving disturbance on a free surface was studied using a time-dependent numerical model. Two frames of reference were tried in making the calculations, one fixed to the surface disturbance, and the other fixed to a laboratory reference frame. Verification studies were performed which indicate the model is capable of accurately reproducing both linear and nonlinear wave profiles, in either frame of reference. However, calculations, in which the disturbance was assumed to be fixed with the fluid streaming past it, were found to be more efficient in terms of computer storage and time. (Author)

AD-A029 246/6GA PC$4.00/MF$3.00
Pennsylvania State Univ University Park Applied Research Lab
Effect of Various Concentrations of WSR-301 Polyethylene Oxide in Water upon the Cavitation Performance of 1/4-in and 2-in Hemispherical Nosed Bodies.
Technical memo.,
C. B. Baker, R. E. A. Arndt, and J. W. Holl. 26 Sep 73, 33p Rept no. TM-73-257
Contract N00017-73-C-1418

Descriptors: *Drag reduction, *Cavitation, *Polyethylene, Oxides, Water, *Hydrodynamic configurations, Concentration(Chemistry), Additives, Noses, Hemispheres.
Identifiers: Polyethylene oxide.

In this investigation the effect of various concentrations of WSR-301 polyethylene oxide in water upon the cavitation performance of a 1/4-inch and a 2-inch hemispherical nosed bodies was measured. The data were acquired at a velocity of 40 fps for the 1/4-inch model and at a velocity of 60 fps for the 2-inch model. Polyox concentrations of 0 and 20 ppm were run during the tests of the 2-inch model. This program was conducted in a 12-inch continuous circuit water tunnel. The results are compared with those of previous investigators.

AD-A029 290/4GA PC$3.50/MF$3.00
New York Univ Bronx Aerospace Lab
The Passage of a Vortex Sheet through a Shock Wave.
Lu Ting. 1975, 11p AFOSR-TR-76-0467
Grant AF-AFOSR-2497-73

Presented at the Proceedings of the International Shock Tube Symposium, 10th Kyoto International Conference Hall, (Japan) 1975.
Availability: Pub. in Modern Developments in Shock Tube Research p378-385, 1975.

Descriptors: *Vortices, *Shock waves, Interactions, Pressure gradients, Flow fields, Diffraction, Reprints.
Identifiers: *Vortex sheets.

The interaction of a plane shock wave of finite strength with a planar vortex sheet or a planar doublet distribution of weak strength is studied. Based upon the physical condition that a free vortex sheet cannot support a pressure difference, rules are established which define the change of the strength of singularity distributions in their passage through the shock. These rules are useful for the physical interpretation of the solution of the entire flow field. The time dependent solution for the entire flow field is constructed by the techniques developed for the diffraction of a shock wave by planar bodies. Solutions are presented for the passage of a vortex ring with a finite vortical core radius through a shock wave. (Author)

AD-A029 328/2GA PC$4.50/MF$3.00
Cincinnati Univ Ohio Dept of Aerospace Engineering
Application of an Interacting Boundary Layer Model to the Supersonic Turbulent Separation Problem.
Final rept.,
M. J. Werle, and S. D. Bertke. Aug 76, 56p Rept no. AFL-76-4-21
Contract N60921-74-C-0203

Descriptors: *Turbulent boundary layer, Viscosity, *Inviscid flow, Interactions, *Supersonic characteristics, Navier Stokes equations, Models, Numerical analysis, Enthalpy, Separation.
Identifiers: *Boundary layer separation.

Numerical solutions to the supersonic interacting turbulent boundary layer equations are obtained for ramp induced separation problems. The method used is the alternating direction implicit scheme wherein a time-like relaxation process is followed to a sought after steady state. The turbulent structure of the flow is modeled with an eddy viscosity approach using both the equilibrium and relaxation models. Detailed comparisons of the present solution with experimental data and available Navier Stokes solutions show that this approach fails to predict the correct extent of upstream influence. The deficiency is traced to the absence of an imbedded shock wave in the interacting boundary layer model of the viscous region. (Author)

AD-A029 336/5GA PC$3.50/MF$3.00
California Univ Riverside Dept of Mathematics
Mathematics of Fluid Flow and Elasticity.
Final rept. 1 Dec 72-30 Jun 76,
Victor L. Shapiro. 1976, 22p AFOSR-TR-76-1077
Grant AF-AFOSR-2456-73

Descriptors: *Applied mathematics, Viscous flow, Incompressible flow, Elastic properties, Navier Stokes equations.
Identifiers: *Fluid flow.

The main part of this paper consists of a description of the following 7 research papers: Positive Newtonian capacity and stationary viscous incompressible flow, Generalized and classical solutions of the nonlinear stationary Navier-Stokes equations, Isolated singularities in fluid flow and elasticity, Isolated singularities in steady-state fluid flow, A counter-example in theory of planar viscous incompressible flow, The discrete equations of fluid flow and elasticity, Subharmonic functions and Hausdorff measure. In these papers, new results were obtained for the nonlinear stationary Navier-Stokes equations---the basic equations in the mathematical theory of viscous incompressible flow. Also new results were obtained in the area of linear elasticity. (Author)

AD-A029 367/0GA PC$4.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
A Direct Comparison of Analytical and Experimental Surface and Flow-Field Data on a 4-Deg Cone at Incidence in a Hypersonic Stream with Laminar Boundary Layers.
Final rept.,
D. E. Boylan, W. T. Strike, and F. L. Shope. Aug 76, 39p Rept no. AEDC-TR-76-84
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-VKF-TR-76-22.

Descriptors: *Wind tunnel tests, *Conical bodies, *Hypersonic flow, *Laminar boundary layer, Computer programs, Machine coding, Viscous flow, Hypersonic waves, Shock waves, Mathematical prediction, Angle of attack, Aerodynamic forces, Pressure, Flow fields, Static stability.

A wind tunnel investigation was conducted in the AEDC Hypersonic Wind Tunnel (C) at Mach numbers near 10 using a 4-deg half-angle cone to study lee side flow-field properties and surface pressures at angles of attack up to about 10 deg. The objective of the study was to provide data to aid in the development of a three-dimensional, hypersonic, viscous shock layer computer code capable of accurately predicting the static stability characteristics of slender bodies at incidence. The results of the present investigation indicate that additional development of the computer code in question is required to fulfill this objective. (Author)

AD-A029 412/4GA PC$4.50/MF$3.00
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Analysis of Wake Survey Data for a U.S. Coast Guard 270-foot Medium Endurance Cutter (WMEC) Represented by Model 5347,
A. C. M. Lin. Jun 76, 52p Rept no. SPD-674-04

Descriptors: *Wake, *Coast Guard ships, Ship models, Propellers(Marine), Harmonic analysis, Hydrodynamics, Pressure gages, Pitot tubes, Radial velocity, Ship keels.

A project was established at the David W. Taylor Naval Ship Research and Development Center to assist the U.S. Coast Guard in the evaluation of a design for a 270-foot medium endurance cutter (WMEC). The report presents the wake survey data of 20 knots (10.288 m/s) speed as obtained from model experiment. These data in conjunction with an harmonic analysis of the data will be used in support of propeller design effort.

AD-A029 418/1GA PC$9.75/MF$3.00
Illinois Inst of Tech Chicago Dept of Mechanics Mechanical and Aerospace Engineering
Generation and Management of Swirling Flows in Confined Streams.
Interim technical rept. 1 Jun 74-1 Jun 76,
M. Ahmed, R. A. Wigeland, and H. M. Nagib. Jun 76, 323p IIT-fluids/heat transfer-R76-2, ARO-ITR-76-1
Grant DAHC04-74-G-0160

Descriptors: *Vortices, *Subsonic wind tunnels, Fluid mechanics, *Helicopters, *Wind tunnel tests, Airfoils, Turbulent flow, Reduction, Measurement, Modification, Trailing edges, Jet flow, Pressure distribution, Decay, Aerodynamic heating, Wing tips, Stratification, Free stream, Hot wire anemometers.
Identifiers: Confined flows, Design, Fluid rotation, Swirling flow, Vortex generators, Swirl management, Streamwise vorticity, Pressure drop, Rotating flows, Flow manipulators, Swirl control.

An experimental investigation of techniques for generating, measuring and controlling swirling flows in confined streams has been carried out. Several typical swirling flows were generated and their careful calibration was carried out using hot-wire anemometers and miniature vane-vorticity indicators. By inserting in these flows various flow manipulators, such as honeycombs, screens and perforated plates, a comparison of the characteristics of the flow downstream of the manipulators (e.g., distribution of streamwise vorticity) to the original test flows provided a measure of the effectiveness of the manipulators in suppressing large scale vorticity as well as clues to dominant mechanism of the flow transformations. It has been found that the effectiveness of a manipulator in suppressing the swirl conditions is reduced somewhat as the strength of the swirl upstream of it is increased, and is improved as the width of the vortex is increased while its strength remains the same. Although honeycombs have a high efficiency in suppressing swirl, their optimum mesh depends on the size of the swirl. The pressure drop across the manipulator, which plays an important role in design of wind tunnels and flow ducts, appears to play a minor role in the management of swirling flows. Recommended procedures for control of large scale swirling and secondary flows are developed, and general concepts are obtained which design and test engineers can adapt for 'tailoring and manipulating' their own special flows with different rotational characteristics. (Author)

AD-A029 494/2GA PC$4.50/MF$3.00
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
Characterization of Sudden-Expansion Dump Combustor Flowfields.
Final rept. 1 Jul 75-30 Jun 76,
James E. Drewry. Jul 76, 67p Rept no. AFAPL-TR-76-52

Descriptors: *Flow fields, *Combustors, *Rocket ramjets, Flow separation, Turbulent flow, Mixing, Gas analysis, Pressure, Expansion, Instrumentation.
Identifiers: *Dump combustors, Sudden-expansion dump combustors.

Basic flowfield studies pertinent to an axisymmetric, sudden-expansion dump combustor have been performed under cold flow conditions. These studies have included surface flow visualization, pressure probing, and gas sampling within a representative combustor duct. Flow visualization tests, which were performed using a surface oil flow technique, graphically demonstrated the complex nature of the flow recirculation/reattachment region downstream of the dump station. Detailed measurements of wall static pressure, flow static pressure, and flow total pressure were made for the combustor flowfield. Gas concentration measurements of simulated fuel (argon)/air mixing were made in the combustor duct using a unique on-line, real-time gas sampling/analysis system. The results obtained from this particular research effort have provided additional insight into the complexities of dump combustor flowfields. (Author)

AD-A029 544/4GA PC$4.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
A Computer Study of Hypersonic Laminar Boundary-Layer/Shock-Wave Interaction Using the Time-Dependent Compressible Navier-Stokes Equations.
Final rept. Jul 74-Apr 76,

B. K. Hodge. Sep 76, 48p Rept no. AEDC-TR-76-119
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-VKF-TR-76-64.

Descriptors: *Laminar boundary layer, *Shock waves, Interactions, Computerized simulation, Algorithms, Hypersonic flow, Mathematical models, Experimental data, Numerical analysis, Navier Stokes equations.
Identifiers: Flow separation.

This report presents the results of an investigation of hypersonic laminar boundary-layer/shock-wave interactions using the method of MacCormack to solve the time-dependent compressible Navier-Stokes equations. Comparisons of the numerical solutions with experimental data were made to ascertain the validity of the numerical method and to identify regions of anomalous behavior. The algorithm gave good results when applied to hypersonic laminar interactions that caused either small or no separated regions and marginal performance when applied to hypersonic laminar interactions having large regions of separated flow. The extents of the separated regions in interactions having large regions of separated flow were underpredicted when compared with experimental data. The predicted wall heat-transfer rates exhibited the correct qualitative trend but not the experimentally measured quantitative values. Consideration of the effects of needed stabilizing terms as well as grid resolution suggests inadequate mesh spacing in the longitudinal direction as the cause of the aforementioned anomalies. If inadequate mesh spacing (and the corresponding lack of support for every term of the Navier-Stokes equations) is a prime cause of the cited discrepancies between the numerical results and the experimental data, then the needed reduction of several orders of magnitude in delta x, would increase CPU time and core storage requirements to untenable levels. (Author)

AD-A029 550/1GA PC$3.50/MF$3.00
Martin Marietta Labs Baltimore Md
Integration of the 3-D Harmonic Kernel.
Interim rept.,
Peter F. Jordan. Jun 76, 24p MML-TR-76-46c, AFOSR-TR-76-0948
Contract F44620-73-C-0041

Descriptors: *Aerodynamic stability, *Lifting surfaces, *Finite element analysis, Integral equations, Numerical analysis, Approximation(Mathematics), Vortices, Downwash, Kernel functions, Three dimensional.
Identifiers: Falkner method.

Currently, the singular integral that arises in the analysis of oscillating lifting surfaces is evaluated by approximate methods, and considerable scatter exists between the results of different methods. In this paper, the application of an accurate approach to the Falkner finite element method is described, and some numerical results are compared with two current levels of approximation. Analytical difficulties that remain to be resolved are briefly discussed. (Author)

AD-A029 570/9GA PC$4.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
The Development of Hot-Wire Anemometer Test Capabilities for M Infinity = 6 and M Infinity = 8 Application.
Final rept. 22 Sep-7 Oct 75,
J. C. Donaldson, C. G. Nelson , and J. E. O'Hare. Sep 76, 33p Rept no. AEDC-TR-76-88
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-VKF-TR-76-38.

Descriptors: *Hypersonic flow, *Hot wire anemometers, Flow, Measurement, Free stream, Boundary layer, Hypersonic wind tunnels, Wind tunnel tests, Magnetic recording systems, Signal processing, Probes, Flow fields, Test facilities.
Identifiers: Flow field probes.

A description is given of test capabilities which have been developed for efficient flow fluctuation measurements using hot-wire anemometry techniques AEDC-VKF supersonic and hypersonic wind tunnels. Data acquistion is facilitated by push button switching among preset wire heating currents and magnetic tape recording of the sensor response signal. Real-time analysis of the signal is available for monitoring during measurements, and subsequent detailed analysis is performed using the tape record. Auxiliary systems have been fabricated which permit model boundary-layer surveys to be made in steps as small as 0.001 in. Optical techniques have been developed that make it possible to monitor and measure probe position relative to the model surface in 0.001-in. increments. Representative results obtained in two series of boundary-layer studies using these capabilities at free-stream Mach numbers of 6 and 8 are shown. (Author)

AD-A029 672/3GA PC$5.50/MF$3.00
Purdue Univ Lafayette Ind Project Squid Headquarters
An Experimental Study on the Aerodynamic Response of a Subsonic Cascade Oscillating Near Stall.
Technical rept. Sep 75-Jul 76,
Franklin O. Carta, and Arthur O. St. Hilaire. Jul 76, 107p Rept no. SQUID-TR-UTRC-2-PU
Contract N00014-75-C-1143
Prepared in cooperation with United Technologies Research Center, East Hartford, Conn., Rept. no. UTRC/R76-912270.

Descriptors: *Airfoils, *Cascade structures, *Stalling, *Aerodynamic loading, Oscillation, Boundary layer, Boundary layer flow, Aerodynamics, Blades, Phase, Angles, Pressure distribution, Stability, Instability, Subsonic flow, Wind tunnel tests, Cascades(Fluid dynamics).
Identifiers: *Unsteady flow, Interblade phase angles.

Tests were performed on a linear cascade of airfoils oscillating in pitch about their midchords at frequencies up to 17 cps, at velocities up to 200 ft/sec and at interblade phase angles of 0 and 45 deg, under conditions of high aerodynamic loading. The measured data included unsteady time histories from chordwise pressure transducers and chordwise hot films. Unsteady normal force coefficient, moment coefficient, and aerodynamic work per cycle of oscillation were obtained from integrals of the pressure data, and indications of the nature and extent of the separation phenomenon were obtained from an analysis of the hot film response data. The most significant finding of this investigation is that a change in interblade phase angle from 0 deg to 45 deg radically alters the character of the blade loading (which governs its motion in a free system) from stable to unstable. Furthermore, the stability or instability is governed primarily by the phase angle of the pressure distribution over the forward 10 to 15 percent of the blade chord. Reduced frequency and mean incidence angle changes were found to have a relatively minor effect on stability for the range of parameters tested. (Author)

20E. Masers and Lasers

AD-A029 313/4GA PC$5.50/MF$3.00
Stanford Research Inst Menlo Park Calif
Infrared Laser and Reaction Rate Study.
Technical rept.,
C. G. Callan, Jr., J. W. Chamberlain, H. Fetterman, H. M. Foley, and P. L. Kelley. Feb 76, 101p Rept no. SRI-JWR-75-1
Contract DAHC15-73-C-0370, ARPA Order-2504

Descriptors: *Infrared lasers, Chemical reactions, Molecular vibration, Energy transfer, Frequency converters, Nonlinear systems, Reaction kinetics, Excitation.
Identifiers: Scientific research.

This study evaluates the scientific issues relevant to the developmental and application of infrared laser technology. The analysis is a companion to an earlier treatment involving visible and ultraviolet systems. It is concluded that maximum impact can be derived from the established infrared technology by a properly expanded effort stressing vibrational energy transfer processes, infrared laser chemistry, and frequency conversion. It is likely that a synthesis of developments in these areas will generate a revolutionary capability in laser chemistry. For each topic key technical areas are identified. It is recommended that a coordinated program at a level of approximately $5 million per year be initiated. (Author)

AD-A029 359/7GA PC$6.75/MF$3.00
Naval Research Lab Washington D C
DARPA-NRL Laser Program - Semiannual Technical Report to Defense Advanced Research Projects Agency - 1 July 1975 to 31 December 1975.
Memorandum rept.,
J. R. Airey, R. Burnham, L. Champagne, N. Djeu , and J. Eversole. Aug 76, 173p Rept no. NRL-MR-3341
DARPA Order-2062

Descriptors: *Lasers, *Chemical lasers, *Electrical lasers, *Infrared lasers, *Gas lasers, Electronic states, Energy transfer, Chemiluminescence, Hydrogen chloride lasers, Xenon lamps.
Identifiers: *Electronic state lasers, Laser diagnostics, Xenon fluoride lasers, Krypton fluoride lasers.

The DARPA-NRL Laser Program is concerned with the development of laser technology in three project areas: chemical infrared lasers, electrical infrared lasers and electronic-state lasers. The chemical infrared laser program includes studies of pulsed HCl laser systems and molecular energy transfer processes. Data have been collected which suggests that intramolecular energy transfer occurs in SF6 at a rate 1,000 times the gas kinetic collision rate. The electrical infrared program emphasizes electric-discharge gasdynamic lasers and electron-beam pumping of potential laser systems in the mid-infrared. Several new energy transfer lasers have been discovered and a detailed discussion of the study of direct excitation HCl lasers is given. A number of excitation approaches are being evaluated for application to electronic state gas lasers. A most important step in the development of rare-gas halide lasers is the reporting here of the operation of XeF and KrF lasers in self-sustained discharges. Chemical pumping of atomic states is shown to lead to sufficient population for lasing and related quenching studies are described. Transverse discharge excitation of metal vapor lasers has been reduced to practice and coherent anti-Stokes Raman spectroscopy is being developed for probing the number density and vibrational temperature of gaseous species in a lasing medium. (Author)

AD-A029 453/8GA PC$3.50/MF$3.00
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Nonionizing Radiation Protection Special Study: Exemption from New Federal Laser Performance Standards for Tactical Army Laser Systems and Field Training Lasers,
David H. Sliney, and Terry L. Lyon. Jul 76, 22p Rept no. USAEHA-42-303-76

Descriptors: *Lasers, *Tactical weapons, *Radiation protection, Standards, Military publications, Radiation hazards.

Identifiers: Nonionizing radiation, Exemptions.

A special study dealing with the requirements of an exemption from the new Federal laser performance standards on tactical Army laser systems was conducted by this Agency. It was determined that the exemption will have an immediate impact upon tactical lasers now in production. It was also evident that a military standard or specification would greatly aid in the implementation of the intent of the exemption to assure system safety features in tactical lasers.

PB-256 695/8GA PC$4.00/MF$3.00
Illinois Univ. at Urbana-Champaign. Electro-Physics Lab.
Electron-Beam Controlled Gas Lasers.
Final rept. 1 Apr 74-31 Mar 76,
Thomas A. DeTemple. Mar 76, 50p UILU-ENG-75-2544
Grant NSF-GK-42104

Descriptors: *Gas lasers, *Electron beams, Excitation, Infrared lasers, Ultraviolet spectra, Visible spectra, Argon, Helium, Xenon, Chlorine, Distribution functions, Electron transfer, Nitrogen, Carbon dioxide lasers, Gas discharges.
Identifiers: Electrical lasers, *Gas discharge lasers, Argon lasers, Helium lasers, Chlorine lasers, Xenon lasers, Ultraviolet lasers, Visible lasers, Nitrogen lasers.

The use of electron-beams to initiate electrical discharges in high pressure gas lasers was explored specifically as a technique for obtaining improved laser performance. Laser action was achieved on electronic transitions in Ar, He, Xe, and Cl and on vibrational-rotational transitions in CO2. Of particular significance was the observation that the neutral Xe transitions near 2 micrometers lased at an order of magnitude higher power and efficiency than had previously been observed. In addition, multi-kilowatt outputs were obtained in the near-infrared from N2 and Ar suggesting that enhanced laser action may be obtained from many previously known lasers at higher gas pressures. The laser lines span the range from .3371 to 216.3 micrometers.

20F. Optics

AD-A029 205/2GA PC$4.00/MF$3.00
Scripps Institution of Oceanography San Diego Calif Visibility Lab
Submerged Reflectance.
Technical memo. Dec 65-Jun 72,
T. J. Petzold, and R. W. Austin. Aug 76, 40p Rept no. VIS-LAB-TM-ML-76-008t
Contract N00024-68-C-1100

Descriptors: *Reflectance, *Reflectometers, *Underwater structures, Surface properties, Calibration, Wet cells, Electrooptics, Optical detection, Concealment, Contrast, Background radiation, Visibility.
Identifiers: Underwater visibility.

Techniques for the determination of the submerged reflectance of painted surfaces are described. Absolute reflectance values were obtained of sample surfaces immersed in a large tank. The values were then transferred to laboratory instruments as calibration standards. The several measurement procedures and equipments are described. The technique for determining submerged reflectance from the measurement of a wetted surface is presented and experimental validation given. (Author)

AD-A029 433/0GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Integrated Optical Circuits and Exploratory Materials Research.
Semiannual techincal summary rept. 1 Jul-31 Dec 75,
Ivars Melngailis. 31 Dec 75, 18p ESD-TR-76-117
Contract F19628-76-C-0002, ARPA Order-2074

Descriptors: *Optical waveguides, *Infrared filters, *Bandstop filters, Gallium arsenides, Radiation attenuation, Neodymium lasers, Near infrared radiation, Substrates, Epitaxial growth, Ion implantation, Beryllium, Light modulators.
Identifiers: *Integrated optics, Directional couplers.

Two types of low-loss single-mode P(+)n(-)n(+) GaAs three-dimensional waveguides have been successfully fabicated and their attenuation coefficients measured. The devices are an optical stripline and a new device, the channel-stop strip guide. The channel-stop strip guides have losses of 0.8 per cm at 1.06 micrometers and 1.1 per cm at 0.920 micrometers; the losses for the optical striplines are 1.2 per cm at 1.06 micrometers and 1.7 per cm at 0.920 micrometers. A first-order loss calculation has yielded attenuation coefficients within 25 percent of these measured values. Both structures have an n(+) substrate, an n(-) epitaxial layer for guiding, and P(+) regions to laterally confine the light. the p(+) regions have a uniform concentration and are formed by multiple-energy Be(+)-ion implantation. The p(+)n(-) junctions show sharp high-voltage breakdowns at sufficiently high electric fields in the n(-) layer (150,000.V/cm) to enable their use in directional-coupler switches and electroabsorption modulators. The causes for reduced external quantum efficiencies in integrated etched-mesa GaAs-AlGaAs double-heterostructure (DH) lasers have been investigated. The primary loss mechanism appears to be the scattering of light by imperfections in the etched end mirrors.

AD-A029 471/0GA PC$3.50/MF$3.00
National Bureau of Standards Washington D C
Improved Microwave-Discharge Source for Ultraviolet Photoemission.
Technical rept.,
T. V. Vorburger, B. J. Waclawski, and D. R. Sandstrom. 19 Aug 75, 7p
Contract NAonr-18-76
Availability: Pub. in Reviews of Scientific Instruments, v47 n4 p501-504 Apr 76.

Descriptors: *Discharge lamps,*Ultraviolet lamps, Ultraviolet radiation, Photoelectric emission, Carbon monoxide, Adsorption, Tungsten, Electric discharges, Microwave frequency, Reprints.
Identifiers: *Microwave discharge lamps.

A microwave-discharge uv light source has been improved to yield significant photon fluxes at 26.9 and 40.81 eV. In order to optimize the 26.9-eV (NeII) and 40.81 (HeII) radiation, the discharge was operated at approximately 2.5 Pa (0.019 Torr) in an external constant magnetic field of approximately 0.070 T(700G), which, together with the oscillating electric field of the cavity, produces electron cyclotron resonance. When the discharge conditions were optimized for production of 40.81-eV photons, features near the Fermi energy in the the photoemission distribution from W(100) for 40.81-eV photons are approximately 6% as intense as the corresponding features in the distribution for 21.22-eV photons. It is estimated that under these conditions the flux of 40.81-eV photons is roughly 50% of the flux of 21.22-eV photons. Photoemission energy distributions with hv = 16.85, 21.22, 26.9, and 40.81 eV have been measured for saturated exposures of CO on W(100) at a temperature of approximately 80 K. The variation in these data with photon energy is important for making orbital assignments to the energy levels of adsorbed molecular CO.

AD-A029 475/1GA PC$3.50/MF$3.00
City Coll New York Dept of Physics
Imaging Through a Surface of an Anisotropic Medium with Application to Light Scattering.
Technical rept.,
M. Lax, and D. F. Nelson. 25 Sep 75, 15p Rept no. TR-25
Contract N00014-76-C-0099
Availability: Pub. in Jnl. of the Optical Society of America, v66 n7 p694-704 Jul 76.

Descriptors: *Light scattering, Anisotropy, Crystals, Magnification, Optical images, Optical properties, Sound waves, Raman spectra, Reprints.
Identifiers: Brillouin scattering, Raman scattering.

The elements of the 4 x 4 matrix that completely describes the geometrical optical properties of a planar surface of an anisotropic crystal as an optical instrument are calculated. The linear and angular magnification submatrices clearly demonstrate the lack of rotational symmetry about the principal ray. The results also show that the astigmatism produced by the surface has in general, nonorthogonal axes. The calculations apply to crystals of arbitrary symmetry, surfaces of arbitrary orientation, and rays of arbitrary direction. The results are applicable to sound waves as well as light waves. Byproducts of this calculation are the ratio of solid angles of ray vectors inside and outside the crystals, as well as the demagnification of a source volume. These factors are combined to relate the ratio of scattered to incident power outside the crystal to the corresponding ratio inside the crystal for a general scattering experiment such as Raman or Brillouin scattering.

PAT-APPL-689 015/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Microscope.
Patent Application,
Windell N. Mohon. Filed 24 May 76, 22p AD-D002 877/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Microscopes, *Holography, Optical equipment components.
Identifiers: *Patent applications, *Holographic lenses, PAT-CL-350-3.5, Binocular vision.

In this patent application a microscope is disclosed as incorporating a light source which broadcasts light in succession through a holographic condenser lens, a transparent object support stage, an object to be magnified, a holographic objective lens, a holographic zoom lens assembly, a combination holographic redirector and magnifier lens, and a holographic eyepiece lens which may or may not be located on the same observational axis as the aforesaid holographic lenses. The holographic eyepiece lens is constructed sufficiently large to accommodate the two eyes of a human observer at the same time, thereby providing binocular vision characteristics by a single lens.

PAT-APPL-691 753/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
A Connector for Coupling Multi-Filament Fiber Optic Cables.
Patent Application,
Adolph Lee Lewis. Filed 1 Jun 76, 12p AD-D002 881/1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Fiber optics transmission lines, *Cables, *Connectors, Multimode, Alignment, Optical communications, Data transmission systems.
Identifiers: *Patent applications, Optical couplers, PAT-CL-350-96.

In the patent application first and second ferrules, which may be substantially identical, have internal bores therethrough to receive the ends of two multifilament fiber optics cables that it is desired to couple together for the transmission of light energy. The ferrules are externally threaded in opposite directions and the multi-filament fiber optic cables are bonded within the respective internal bores of the ferrules with a terminal end ground and polished substantially optically flat. A central sleeve member is internally threaded at two ends in opposite directions to supportively receive the respective external threads of the two ferrules so that when the central sleeve member is rotated in a single direction the terminal ends of the two ferrules are drawn together in a common axial alignment.

PAT-APPL-695 298/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Compact Three-Beam Interferometer.
Patent Application,
Louis Sica, Jr. Filed 11 Jun 76, 12p AD-D002 884/5
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Interferometers, *Laser beams, *Beam splitting, Optical equipment components, Optical instruments, Vibration.
Identifiers: *Patent applications, PAT-CL-350-160.

This patent application makes use of two optical assemblies in which the optical elements of each assembly are joined together to provide a rigid optical assembly in which an incident laser beam is divided into three optical beams. The two outer beams travel equal distances in the optical elements and the three beams are focused onto a Ronchi ruling at the focal plane. The arrangement of optical elements results in low sensitivity to longitudinal vibrations which constitutes the main improvement of this invention.

PAT-APPL-701 467/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Fiber Optic Cable Connector.
Patent Application,
Adolph L. Lewis. Filed 1 Jul 76, 13p AD-D002 890/2
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Fiber optics transmission lines, *Cables, *Connectors, Multimode, Alignment, Optical communications, Data transmission systems, Adhesives.
Identifiers: *Patent applications, Optical couplers, PAT-CL-350-96.

In the patent application a fiber optic cable connector is comprised of two ferrules, a collar member, and a connection sleeve. First and second ferrules each have an internal bore to receive the end of fiber optic cable bundles together with a suitable bonding material for securing the fiber optic cable bundles. External threads on the outermost portion of the second ferrule at its terminal end are engaged by the internal threads of a connection sleeve which has an inwardly disposed flange at its other end dimensioned to bear upon an end of the collar member for drawing the two terminal ends of the fiber optic cable bundles together in an aligned assembly.

PATENT-3 954 323 Not available NTIS
Department of the Navy Washington D C
Optical Waveguide Linear Modulator Array.
Patent,
Ronald A. Andrews, A. Fenner Milton, and Thomas G. Giallorenzi. Filed 23 Mar 73, patented 4 May 76, 5p AD-D002 896/9, PAT-APPL-344 404
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optical waveguides, *Waveguide couplers, *Electrooptics, *Patents, Electrodes, Electric fields, Fiber optics, Refractive index, Optical communications, Data transmission systems, Integrated circuits.
Identifiers: PAT-CL-350-96, *Optical modulators.

This invention provides an apparatus and method for obtaining a continuous linear array of optical sources whose phases are modulated by predetermined functions. The apparatus includes an optical waveguide having an input coupler suitable for coupling desired radiation into the waveguide and an output coupler suitable for radiation out of the waveguide. The waveguide is arranged in combination with a plurality of electrodes along the length of the path of the optical beam in the waveguide. The electrodes have different shapes such that when an electric field is applied across the electrodes, the index of refraction of the waveguide material will be changed due to the electric field. The phase front of the radiation will be affected depending upon the shapes of the electrodes and the strength of the electric field.

PATENT-3 958 189 Not available NTIS
Department of the Navy Washington D C
Stimulated Coherent Cyclotron Scattering, Millimeter, and Submillimeter Wave Generator.
Patent,
Phillip A. Sprangle, and Victor L. Granatstein. Filed 4 Jun 75, patented 18 May 76, 6p AD-D002 900/9, PAT-APPL-583 729
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Infrared transmitters, *Patents, Far infrared radiation, High power, Electron beams, Microwaves, Coherent scattering, Pumping(Electronics), Millimeter waves, Submillimeter waves, Broadband, Narrowband, Tuning.
Identifiers: PAT-CL-331-94.5.

The invention relates to an apparatus and technique for generating millimeter and submillimeter radiation and more particularly to an improved technique for providing high power far infrared radiation by coherent stimulated scattering of microwave radiation from an intense relativistic electron beam.

PATENT-3 963 308 Not available NTIS
Department of the Navy Washington D C
Focusing Coupling Device for Multi Optical-Fiber Cable.
Patent,
Robert L. Lebduska. Filed 25 Jun 73, patented 15 Jun 76, 7p AD-D002 908/2, PAT-APPL-373 583
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fiber optics transmission lines, *Cables, *Couplers, *Patents, Data transmission systems, Signal processing, Optical communications, Alignment.
Identifiers: Optical couplers, PAT-CL-350-96.

A coupling device is provided for a multi optical-fiber cable in which the bared free ends of the individual fibers to be coupled or terminated are geometrically oriented in a substantially focusing relation to each other. This enables the propagated light beam patterns being transmitted through each fiber end to be concentrated by being superimposed substantially at a common focal plane thereby enhancing the intensity of light being available for transmission across the coupling.

PB-256 644/6GA PC$4.50/MF$3.00
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
The National Measurement System for Optics.
Final rept.,
Dennis A. Swyt. Mar 76, 63p NBSIR-75-942

Descriptors: *Optical measurement, *Optical equipment, *Standards, Systems analysis, Densitometers, Instrumentation, Government policies, Regulations, National government, State government, Local government, Microscopes, Optical lenses, Photographic equipment, Microfilm, Radiography, Tests, Industrial management, Questionnaires, Surveys, Law enforcement.
Identifiers: National Measurement System.

NBS has conducted a study of the National Measurement System for Optics. The proposed system model is discussed including the role of standards committees, instrument manufacturers and measurement users. The economic dimensions of the measurements impact areas and the technological base from which new measurement technology springs are described.

20I. Plasma Physics

AD-A029 381/1GA PC$3.50/MF$3.00
Naval Research Lab Washington D C
Further Numerical Study of the Dissipative Trapped-Electron Instability in Tokamaks Including Magnetic Curvature Drift Resonances.
Interim rept.,
K. R. Chu, and Wallace M. Manheimer. Aug 76, 16p Rept no. NRL-MR-3336
Sponsored in part by Energy Research and Development Administration, Washington, D.C.

Descriptors: *Tokamaks, *Plasmas(Physics), Electron energy, Instability, Numerical analysis, Dispersion relations.
Identifiers: *Plasma instabilities.

The dispersion relation for the dissipative trapped-electron mode including the effects of magnetic shear, finite ion Larmor radius, banana-plateau velocity space separation, magnetic curvature drift resonance, and ion-ion collisions, etc. is used to examine the plasma stability of recent tokamak experiments. Regimes of importance of various effects in these experiments are also discussed. Instabilities mostly occur at (k sub theta)rho about = 1, where (k sub theta) is the azimuthal wave number and (rho sub i) is the ion Larmor radius. The often used anomalous heat conduction coefficient, gamma/(k sub theta, sup 2), predicts losses comparable to those observed in TFR, ST, and ATC.

AD-A029 408/2GA PC$7.50/MF$3.00
Naval Research Lab Washington D C
Laser-Fusion Studies at NRL. A Report to ERDA for the Period July 1974 to June 1975.
Memorandum rept.,
S. E. Bodner. Aug 76, 182p Rept no. NRL-MR-3315

Descriptors: Lasers, *Plasmas(Physics), Laser beams, Plasma medium, Interactions, Glass lasers, Light scattering, Magnetic fields, X Ray spectra, Emission spectra, X Ray film, Calibra-

tion, Aluminum, Ultraviolet spectra, Naval research.
Identifiers: *Laser fusion, *Nuclear fusion.

This report summarizes work done at NRL on laser fusion related to problems during FY 1975. Included are sections related to laser development and to experimental studies of laser plasma interaction. (Author)

AD-A029 673/1GA PC$3.50/MF$3.00
Mission Research Corp Santa Barbara Calif
Scaling of the Time Dependent SGEMP Boundary Layer.
Topical rept.,
C. L. Longmire , and N. J. Carron. Apr 76, 18p
MRC-R-262, DNA-3975T
Contract DNA001-76-C-0086

Descriptors: *Electron emission, *X rays, Plasmas(Physics), Boltzmann equation, Partial differential equations, Maxwells equations.
Identifiers: Nuclear explosion effects.

The authors discuss the scaling laws for the time dependent behavior of the one dimensional SGEMP electron boundary layer. For an X-ray pulse that is constant in time or rises like any given power of time a single solution suffices for all fluxes. For a more realistic time history with a finite FWHM, the equations reduce to a single parameter family, the parameter being the ratio of the pulse FWHM to the characteristic plasma period. For the time behavior, the unit of time is taken as the FWHM. Both the scaled Boltzmann Equation and Newton's Equations are presented.

20J. Quantum Theory

PB-257 024/0GA PC$3.50/MF$3.00
National Bureau of Standards, Washington, D.C.
Reflection of Charged-Particle Beams at Near-Grazing Incidence.
Final rept.,
L. V. Spencer, and C. Eisenhauer. Jun 76, 3p
Pub. in Transactions of the American Nuclear Society, v23 p609-610 Jun 76.

Descriptors: *Electron scattering, Backscattering, Monte Carlo method.
Identifiers: Reprints.

An analytic expression is given for the angular distribution of charged particles reflected from a surface for a near-grazing incident beam. This expression predicts the apparent specular reflection peak observed in experiments and Monte Carlo calculations.

20K. Solid Mechanics

AD-A029 208/6GA PC$5.00/MF$3.00
Naval Weapons Center China Lake Calif
A Shell-Continuum Transition Finite Element.
Technical publication,
John W. Onstott. Jun 76, 79p Rept no. NWC-TP-5876

Descriptors: Continuum mechanics, Finite element analysis, *Elastic shells, *Pressure vessels, Geometry, Axisymmetric, Deformation, Thickness.

A finite element analysis procedure for axisymmetric shell problems including regions where shell theory is not applicable is developed. This procedure allows for the analysis of complex shell structures using a combination of shell and elasticity finite elements. A transition element for linking these two incompatible elements is developed. The inclusion of the transition element is accomplished through the addition of a subroutine to an existing finite element program. Example solutions are included to demonstrate the accuracy and utility of the procedure. (Author)

AD-A029 220/1GA PC$5.50/MF$3.00
Naval Research Lab Washington D C Shock and Vibration Information Center
The Shock and Vibration Digest. Volume 8, Number 8, August 1976.
Aug 76, 104p
See also Volume 8, Number 7, AD-A027 392.
Availability: Paper copy also available from Shock and Vibration Information Center, Naval Research Lab., Code 8404, Washington, D. C. 20375. Annual subscription.

Descriptors: *Shock(Mechanics), *Vibration, *Abstracts, Cylindrical bodies, Mathematical models, Structural properties, Civil engineering, Elastic properties, Wave propagation, Hydrodynamics, Stresses, Strain(Mechanics), Test methods.

The Shock and Vibration Digest is a monthly publication of the Shock and Vibration Information Center. The goal of the Digest is to provide efficient transfer of sound, shock, and vibration technology among researchers and practicing engineers. Subjective and objective analyses of the literature are provided along with news and editorial material.

AD-A029 414/0GA PC$4.00/MF$3.00
California Inst of Tech Pasadena Div of Engineering and Applied Science
On Finite Anti-Plane Shear for Incompressible Elastic Materials.
Technical rept.,
James K. Knowles. Aug 76, 30p Rept no. TR-36
Contract N00014-75-C-0196

Descriptors: *Deformation, *Incompressibility, Materials, Mathematical models, Elastic properties, Nonlinear systems, Shear properties, Stresses, Strain(Mechanics), Isotropism.
Identifiers: Elasticity, Antiplane shear, *Elastostatics.

This paper is concerned with deformations corresponding to anti-plane shear in finite elastostatics. The principal result is a necessary and sufficient condition for a homogeneous, isotropic, incompressible material to admit nontrivial states of anti-plane shear. The condition is given in terms of the strain energy density characteristic of the material and is illustrated by means of special examples. (Author)

AD-A029 641/8GA PC$4.00/MF$3.00
Polytechnic Inst of New York Brooklyn Dept of Aerospace Engineering and Applied Mechanics
Modal Method for Free Vibration of Oval Cylindrical Shells with Simply Supported or Clamped Ends.
Interim rept.,
Y. N. Chen, and Joseph Kempner. Aug 75, 48p
Poly-AE/AM-75-14, AFOSR-TR-76-1067
Contract F44620-74-C-0047

Descriptors: Cylindrical bodies, *Elastic shells, *Stiffened cylinders, Kinematics, *Vibration, Stresses, Strength(Mechanics), Airframes, Deformation, Structural analysis,
Identifiers: *Modal analysis, *Cylindrical shells.

The free vibration of an oval cylindrical shell of finite length was investigated. The analysis was based upon the kinematic relations of the first-order shell theory of Sanders, which is readily reducible to the Donnell-type of shell theory via a tracing constant k sub s. In-plane inertia was retained throughout the present analysis. A method incorporating a type of eigenfunction expansion into Hamilton's principle, suitable for the present class of problems, was developed. Such a method was judged to be far more convenient than a parallel Fourier analysis. In addition to the determination of the natural frequencies and deformation characteristics, attention was focused on the influence of various types of simple support and clamped conditions enforced at the edges of the shell. Two modes of deformation, corresponding to a 'higher' and a 'lower' frequency were observed to exist for every pair of axial and circumferential wave numbers, depending upon the degree of circumferential symmetry in the deformed pattern. (Author)

AD-A029 652/5GA PC$4.00/MF$3.00
Northwestern Univ Evanston Ill Structural Mechanics Lab
Elastodynamic Effects on Crack Arrest.
Interim rept.,
J. D. Achenbach, and P. K. Tolikas. Jul 76, 30p
Rept no. NU-SML-TR-76-2
Contract N00014-76-C-0063
Presented at Symposium on Fast Fracture and Crack Arrest Annual Meeting of the ASTM, Jun 76.

Descriptors: *Crack propagation, *Cracking(Fracturing), Stress analysis, Stress relieving, Stress waves, Stress relaxation, Elastic properties, Tensile properties, Symposia.
Identifiers: *Elastodynamics, Fracture arrests, Crack propagation arrests, Crack arrests.

In the first part of the paper, elastodynamic stress intensity factors and their role in the fracture criterion of the balance of rates of energies are discussed. The remainder of the paper deals with the near-tip stress field for a sudden discontinuous change of the speed of a rapidly propagating crack tip, including the case that the crack tip is suddenly arrested. Analytical expressions are derived for the elastodynamic stress intensity factor, for the case that the crack tip speed instantaneously changes from c sub 1 to c sub 2, where c sub 2 < c sub 1. Arrest, or continued propagation of a crack tip at a reduced speed are investigated.

AD-A029 665/7GA PC$3.50/MF$3.00
Northwestern Univ Evanston Ill Structural Mechanics Lab
Wave Propagation, Elastodynamic Stress Singularities and Fracture.
Interim rept.,
J. D. Achenbach. May 76, 19p Rept no. NU-SML-TR-76-1
Contract N00014-76-C-0063, Grant NSF-ENG-70-01465
Presented at the International Congress of Theoretical and Applied Mechanics (14th).

Descriptors: *Fracture(Mechanics), *Cracks, *Cracking(Fracturing), Crack propagation, Wave propagation, Stress waves, Stresses.
Identifiers: *Elastodynamics, Stress intensity factors.

The singular part of the elastodynamic field in the vicinity of a crack tip plays an important role in fracture mechanics considerations. In this paper analytical, numerical and experimental methods to determine near-tip elastodynamic fields are reviewed, and the interpretation of stress intensity factors is discussed within the context of the fracture criterion of the balance of rates of energies. Elastodynamic effects generated by rapid propagation of the crack as well as by the diffraction of incident stress waves are considered. Propagation in the plane of the crack, as well as skew crack propagation and crack bifurcation are investigated. (Author)

ESDU-76013 PC$194.50
Engineering Sciences Data Unit Ltd., London (England).
Elastic Stresses and Deflections under Uniform Pressure of Flat Rectangular Sandwich Panels; All Edges Simply-Supported

(Isotropic Face Plates and Orthotropic Cores of Zero Flexural Stiffness).
Jun 76, 13p* ISBN-0-85679-149-0
For information on availability of series, sub-series, and other individual data items, write NTIS, Attn: ESDU, Springfield, Va. 22161.

Descriptors: *Sandwich panels, Loads(Forces), Shear stresses, Deflection, Aircraft, Floors, Bulkheads, Buildings, Walls, Data sources, Graphic methods, User needs, Great Britain.
Identifiers: ESDU/S, *Simply supported plates, *Engineering design data, *Design engineering.

The report develops the elastic stresses and deflections under uniform pressure of flat rectangular sandwich panels with all edges simply-supported. Typical applications include aircraft flooring, pressurized bulkheads, and structural panels in buildings.

20L. Solid-State Physics

AD-A029 215/1GA PC$3.50/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
Total Dose Effects on Surface State Density, Carrier Concentration and Mobility in MOS Layers.
Final rept.,
Jan E. Whitefield, Harold D. Southward, and Roe J. Maier. Aug 76, 21p Rept no. AFWL-TR-76-507
Presented at the IEEE Conference held at San Diego, Calif., on 28 Jul 76.

Descriptors: *Metal oxide semiconductors, *Charge carriers, *Hall effect, Mobility, Radiation dosage, Channels, Layers, Surface properties, Electromagnetic susceptibility, Ionizing radiation, Density.
Identifiers: *Hall mobility, *Radiation effects, Electrical conductivity.

Measurements are reported in which the induced carrier concentration and hall mobility of p-channel MOS structures are determined as a function of surface potential by Hall effect measurements at two different temperatures. The ratio of the Hall mobility to conductivity mobility was also determined. The density of interface states within 6 kT of the conduction band edge were calculated. The density of these states generally decrased with ionizing radiation dose and the channel carrier mobility was found to decrease with irradiation at low surface potentials. At high surface potentials, channel carrier mobility was relatively insensitive to ionizing radiation. Carrier scattering mechanisms within the conducting channel are discussed. (Author)

AD-A029 216/9GA PC$3.50/MF$3.00
Air Force Weapons Lab Kirtland AFB N Mex
Silicon Lattice Constraints on Structure of Interface States.
Final rept.,
Roe J. Maier. Aug 76, 23p Rept no. AFWL-TR-76-506
Presented at the IEEE Conference held at San Diego, Calif., on 28 Jul 76.

Descriptors: *Semiconductors, *Amorphous materials, *Interfaces, *Crystal lattices, Silicon, Silicon dioxide, Chemical bonds, Conduction bands, Valence bands, Models, Oxygen, Stoichiometry.
Identifiers: Interface states, Molecular models.

Wooden ball molecular models were used to study the constraints placed on Si-SiO2 interface structures by the silicon lattice. Where there was just a single bond between the lattice and the amorphous SiO2, no constraints were evident. Where there were two bonds, it was possible to produce a Si-O-Si silica bond where both Si atoms were in the lattice. The two bond case resulted in a structure related to the SiA center in bulk and would create interface states near conduction and valance bands. During oxide growth, successive planes of the lattice are removed, and there is an edge of a partially removed plane where triplets of bonds occur. These triplets provide space for only one oxygen atom. This triply bonded oxygen atom is proposed as a model for the structure of Qss. An oxidation mechanism is assured in which the Si atoms which are part of the positively charged Qss structure we removed by the attraction of a negatively charged oxidizing species. Using this mechanism and the models for Qss and Nss, a form is derived for the radiation susceptibility of the interface. (Author)

AD-A029 241/7GA PC$4.00/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
Study of Electronic Transport and Breakdown in Thin Insulating Films.
Final rept. 1 Jul 72-30 Nov 75,
Walter C. Johnson. May 76, 48p RADC-TR-76-158
Contract F19628-72-C-0298, ARPA Order-2180

Descriptors: *Dielectric films, *Electron transport, Electric fields, Coronas, Quenching(Inhibition), Trapping(Charged Particles), Electron irradiation, *Silicon dioxide, Silicon, Charge carriers.
Identifiers: Insulating films, *Dielectric breakdown, Self quenching, Electron injection.

This report summarizes the results obtained in a research program directed toward a basic understanding of electronic transport, charge trapping, and dielectric breakdown in thin (500-3000 A) silicon dioxide films thermally grown on silicon substrates. The research techniques that were developed and used are applicable to other insulating films, but up to this time the author has concentrated on the properties of thermally grown SiO2 films because of the importance of the Si/SiO2 in modern solid-state circuits. The program consisted of a number of coordinated investigations which included studies of charge injection, transport, and trapping in which the injection of charge carriers into the insulator was induced by corona charging of the surface of the insulator, the study of the instability at the onset of breakdown and of catastropic breakdown itself by the self-quenching technique, the probing of trapping centers in the in the insulating film by charge-discharge techniques using equipment which were developed especially for this purpose, studies of charge transport and trapping using an electron beam for carrier injection, studies of lateral nonuniformities in MIS structures by electrical measurement techniques and by use of a scanning electron microscope, and theoretical modeling of hot-electron transport and of localized breakdown.

AD-A029 281/3GA PC$4.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Conceptual Phase Diagrams and Their Applications to Itinerant Electron Magnetism.
Journal article,
John B. Goodenough. 30 Jan 74, 57p MS-2951H, ESD-TR-76-189
Contract F19628-73-C-0002
Availability: Pub. in Magnetism in Metals and Metallic Compounds p35-90, 1976.

Descriptors: *Magnetic materials, *Phase diagrams, Solid state physics, Electrons, Metal compounds, Atomic structure, Crystal structure, Magnetic properties, Band theory of solids, Reprints.
Identifiers: Magnetic ordering.

An adequate description of the magnetic properties of a solid requires not only a knowledge of the relative energies of the atomic outer-electron states, but also the location of a given electron state within a conceptual phase diagram of electronic properties. In the last few years the physical ideas essential to this task have been identified. The intent in this paper is to review briefly these ideas and to illustrate their usefulness. First, phase diagrams are developed. Then the report reviews briefly some complex magnetic and crystallographic properties exhibited by several metallic compounds and show how their magnetic order and the magnitudes of the observed atomic moments can be derived in terms of the phase diagrams, known variations across the Periodic Table, and qualitative arguments about the energy bands. These examples illustrate how, from a small set of physical ideas and the phase diagrams, it is possible to develop experimental strategies for controlled modification of known magnetic materials and for a search for new magnetic materials.

AD-A029 292/0GA PC$3.50/MF$3.00
California Univ Riverside Dept of Physics
Theoretical Interpretations of the Angular Dependence of the ESR Resonance Field of Dy in Pd.
Y. Yang, N. L. Huang Liu, and R. Orbach. 21 Oct 75, 4p
Grant AF-AFOSR-2077-73
Availability: Pub. in Solid State Communications, v18 p1443-1446 1976.

Descriptors: *Electron spin resonance, Single crystals, Ions, Electrons, Anisotropy, Dysprosium, Palladium, Reprints.
Identifiers: Exchange interactions, Crystal field theory.

The conclusion is that in metals or alloys the exchange interaction between a magnetic ion and the conduction electrons, or between two magnetic ions (e.g., the Ruderman-Kittel interaction), should include orbitally anisotropic terms if the charge distribution of the magnetic ion and/or the conduction electrons is nonspherical. The importance of orbital anisotropy has also been found by Ray in calculating the effective crystal field parameters in rare earth metals and alloys.

AD-A029 314/2GA PC$4.50/MF$3.00
Princeton Univ N J Dept of Electrical Engineering
Study of Electronic Transport and Breakdown in Thin Insulating Films.
Semi-annual technical rept. no. 1,
Walter C. Johnson. 1 Jun 76, 66p NVL-0059-001
Contract DAAG53-76-C-0059, DARPA Order-2182

Descriptors: *Semiconducting films, *Electron transport, *Thin films, *Electrical insulation, Dielectrics, Trapping(Charged particles), Charge transfer, Silicon dioxide, Electrical corona.
Identifiers: *Dielectric breakdown.

Recent progress is reported on an ongoing program of studies of high-field electronic injection, transport, trapping, and dielectric breakdown in thin insulating films. The studies include corona-induced high-field injection and trapping, the combined use of corona and optical excitation, an investigation of the high-field generation of interface states, a study of high-field instabilities in the MOS system, and use of the scanning electron microscope to study lateral nonuniformities. (Author)

AD-A029 319/1GA PC$4.00/MF$3.00
State Univ of New York At Albany Dept of Physics
Diffusion Dans Les Semiconducteurs du Groupe IV (Diffusion in Semiconductors of Group IV),
J. Bourgoin , and J. W. Corbett. Jul 76, 29p
Contract N00014-75-C-0919
Text in French; abstract in English.

Descriptors: *Semiconductors, Group IV compounds, *Diffusion theory, Mobility, Silicon, Germanium, Interstitial, Substitution reactions, Experimental data, Impurities, Enthalpy, Heat of Formation, France.

The quantities which theoretically and experimentally characterize diffusion are briefly reviewed and discussed. Emphasis is placed on the difficulties in reconciling theory and experiment; in particular it is noted that self-diffusion in silicon is still a matter of controversy. The different aspects of charge state effects on diffusion are discussed in detail. (Author)

AD-A029 449/6GA PC$4.00/MF$3.00
Oak Ridge National Lab Tenn
Inverse Mean Free Path, Stopping Power, CSDA Range, and Straggling in Ni, Cu, and Au for Electrons of Energy S or equal 10 keV calculated from a Statistical Model.
Interim rept. no. 3, Mar-Jun 76,
J. C. Ashley, C. J. Tung, R. H. Ritchie, and V. E. Anderson. Jun 76, 39p RADC-TR-76-220
See also report dated Apr 76, AD-A025 488.

Descriptors: *Nickel, *Copper, *Silver, *Gold, *Electron energy, Solids, Mathematical models, Tables(Data), Wave functions, Computations.
Identifiers: *Stopping power, Mean free path.

A statistical model is described and employed to calculate inverse mean free path, stopping power, and mean square energy loss for electrons of energy from 0.5 eV to 10 keV above the Fermi level in several solids. From these calculations, electron range in the continuous-slowing-down approximation and straggling are evaluated for electron energies from 10 eV to 10 keV. Table of these quantities are presented for the solids Ni, Cu, Ag, and Au. Graphical displays of the inverse mean free path and stopping power for these four solids are also included.

AD-A029 451/2GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Cambridge Dept of Physics
Technology and Physics of Infrared and Point Contact Diodes.
Semiannual technical rept. no. 4, 1 Nov 75-30 Apr 76,
Ali Javan. 9 Jun 76, 19p RADC-TR-76-234
Contract F19628-74-C-0182, ARPA Order-2618
See also report dated Mar 76, AD-A025 330.

Descriptors: *Tunneling(Electronics), Tunnel diodes, Dielectric films, Fabrication, Thin films, Aluminum, Alumina, Lead(Metal), Metal films, Nickel, Oxidation, Liquid helium, Superfluidity, Argon lasers, Dye lasers, Light sources, Photolithography, Tungsten, Holography, Microwave antennas, Cryogenics, Photoelectric emission, Visible spectra, Thermal properties, Whiskers(Crystals), Experimental design.
Identifiers: *Point contact diodes, *Metal insulator metal junctions, Electron tunneling, Design.

A tube and mirrors have been installed from the argon and dye laser room to the diode testing area. Additional lead on aluminum diodes were evaluated at liquid helium temperature. An oxidation study was conducted on nickel which demonstrated that 400 square micrometer junctions from 100 ohms through 1 megohm can be made. Real time V-band and 337 micrometer holographic receptors have been designed and masks are being fabricated. Measurements are in progress on MOM (tungsten on nickel) point contact diodes to evaluate their effective antenna resistance as a function of length. The effective diode resistant is varied by changing whisker pressure and response is maximized with respect to whisker orientation in the focused laser beam.

AD-A029 469/4GA PC$3.50/MF$3.00
State Univ of New York At Albany Dept of Physics
Ionization Enhanced Diffusion.
D. Peak, J. W. Corbett, and J. C. Bourgoin. 23 Feb 76, 5p
Contract N00014-70-C-0296
Availability: Pub. in the Jnl. of Chemical Physics, v65 n3 p1206-1210, 1 Aug 76.

Descriptors: *Semiconductors, *Ions, *Diffusion theory, Crystal lattices, Migration, Reprints.
Identifiers: Ion diffusion, Diamond lattices.

The general three-dimensional diffusion equations, along with the corresponding tensor diffusivities, are established for the normal ionization-enhanced diffusion mechanism (which is equivalent to a general two-channel diffusion mechanism) and for the Bourgoin mechanism, the latter being explicitly developed for the diamond lattice. (Author)

AD-A029 476/9GA PC$3.50/MF$3.00
City Coll New York Dept of Physics
Comment on Keller's Theory of Brillouin Scattering.
Technical rept.,
M. Lax, and D. F. Nelson. 24 Sep 75, 8p Rept no. TR-26
Contract N00014-76-C-0099
Availability: Pub. in Physical Review B, v14 n2 p837-840, 15 Jul 76.

Descriptors: Phonons, Anisotropy, *Light scattering, Crystal lattices, Cadmium sulfides, Surface properties, Reprints.
Identifiers: *Brillouin scattering.

Keller has published a treatment of Brillouin scattering inside an anisotropic crystal with application to off-axis phonons in CdS, whereas the present authors have provided a treatment valid for a crystal of any symmetry and level of anisotropy, any direction of input light, scattered light, and sound (consistent with phase matching) and to either polarisation of the light beams and any type of sound wave. Moreover, the treatment includes solid angle and demagnification corrections for an arbitrarily oriented exit crystal surface. As the treatment of Keller does not use the dyadic Green's function appropriate to an anisotropic medium, his results are in disagreement with the present authors after they have omitted the surface corrections from the theory. (Author)

AD-A029 551/9GA PC$3.50/MF$3.00
Wayne State Univ Detroit Mich Coll of Engineering
Mechanism of Exoelectron Emission From Solid Surfaces.
Final rept. 1 Jul 73-30 Apr 76,
L. Himmel, and Peter F. Braeunlich. May 76, 18p AFOSR-TR-76-0994
Grant AF-AFOSR-2573-74

Descriptors: *Electron emission, *Surface properties, *Triboelectricity, *Thermionic emission, Magnetic separation, Coincidence counting, Ions, Photons, Electrons, Anodic coatings, *Oxides, Strain(Mechanics), Fracture(Mechanics).
Identifiers: Exoelectrons, Aluminum oxides, Nickel oxides.

Using sensitive single-particle and single-photon detectors, combined with magnetic discrimination techniques, it is shown that electrons, positive and negative ions, and photons are all emitted simultaneously when rupture of the superficial oxide film occurs during tensile deformation of oxide-covered metals. With compact adherent, anodically-grown Al2O3 films on Al and dense thermally-grown NiO films on Ni, the major fraction of the emitted particles are low energy electrons. Particle emission is believed to originate from crack surfaces in the oxide film. The dependence of the electron emission yield on oxide thickness has been established for dense anodic oxide films up to 2000 A thick on Al. It is also found that the total or integrated yield for 2000 A thick oxide films decreases in the order Al to ni to Ti. The tribostimulated electrons exhibit a rather broad energy spectrum which is definitely non-Maxwellian. The emission behavior is also found to depend strongly on the conditions under which anodic oxide films are grown. It is tentatively suggested that the emission observed from dense oxide films may be primarily of thermionic origin, the needed excitation energy being provided by the elastic strain energy stored in the oxide film that is released during fracture of the film. (Author)

AD-A029 553/5GA PC$3.50/MF$3.00
University of Southern California Los Angeles Electronic Sciences Lab
Optical Studies of Ion Implanted Species in Group IV and III-V Semiconductors.
Final rept. 1 Jun 71-31 May 76,
W. G. Spitzer. 1976, 17p AFOSR-TR-76-1028
Grant AF-AFOSR-2075-71

Descriptors: *Semiconductors, *Ion implantation, Optical properties, *Gallium arsenides, *Gallium phosphides, Dielectric properties, Infrared radiation, Vibrational spectra, Absorption spectra.

This is the final report of a grant to study the optical properties of ion implanted semiconductors. The materials studied are primarily GaAs and GaP. High energy ion implants were studied by measuring the changes in the near infrared dielectric constant, the localized mode absorption and the reflection near the fundamental lattice vibrational band. The implantation process produces substantial changes in all three properties including increases in the high frequency dielectric constant, observable impurity-induced absorption bands, and a total alteration of the reststrahlen behavior. Post implantation annealing of these changes has also been investigated. The material has all been published and a list of the papers is included in the report. (Author)

PAT-APPL-683 808/GA PC$4.00/MF$3.00
Department of the Navy Washington D C
Ferroelectric Crystals Having Tailored Domain Patterns.
Patent Application,
Leslie E. Cross, and Robert E. Newnham. Filed 7 Jun 76, 35p AD-D002 882/9
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Ferroelectric crystals, *Domains, Twinning(Crystallography), Vibration, Control, Frequency stabilizers, Piezoelectric crystals.
Identifiers: *Patent applications, PAT-CL-423-263.

In the patent application ferroelectric crystals and ceramics are prepared with tailored domain patterns which are selected to enhance or suppress certain modes of vibration which may include those normally unattainable such as, for example, second harmonics. Piezoelectric crystals are used in a wide variety of electronic applications as the frequency control or stabilizing means.

20M. Thermodynamics

AD-A029 174/0GA PC$3.50/MF$3.00
Office of Naval Research London (England)
International Heat Pipe Conference (2nd), Bologna, Italy, 31 March - 2 April 1976.
Conference rept.,
Robert F. Lopina. 1976, 14p Rept no. ONRL-C-19-76

Descriptors: *Heat pipes, *Heat transfer, Spacecraft, Heat exchangers, Conduction(Heat

transfer), Conferences, Italy, Low temperature, Gravity, International.

This report summarizes the presentation at a three-day international meeting on heat pipe research and developments. The meeting dealt with gravity-assist heat pipes, low temperature heat pipes, variable conductance heat pipes, rotating heat pipes, heat-pipe materials, evaporative heat transfer mechanisms, zero-gravity testing and terrestrial and spacecraft applications of heat pipes. (Author)

AD-A029 293/8GA PC$3.50/MF$3.00
Stanford Univ Calif Dept of Physics
Hydromagnetic Effects in Superfluid He(3),
Alexander L. Fetter. 1976, 13p AFOSR-TR-76-0622
Grant AF-AFOSR-2576-74
Availability: Pub. in Quantum Statistics and the Many-Body Problem, p127-138 1976.

Descriptors: *Superfluidity, *Hydromagnetics, N Body problem, Helium, Quantum statistics, Three dimensional, Magnetic fields, Superconductors, Reprints.
Identifiers: Helium 3.

A Ginzburg-Landau expansion is used to study a uniformly-flowing p-wave Fermi superfluid in a static magnetic field near T sub c. The three-dimensional state undergoes strong hydromagnetic suppression, affecting the critical current, the dipole energy, and the overall phase diagram. (Author)

20N. Wave Propagation

AD-A029 238/3GA PC$5.00/MF$3.00
Systems Science and Software La Jolla Calif
Particle Simulation Techniques for SGEMP.
Topical rept.,
I. Katz, J. Harvey, and A. Wilson. Apr 75, 95p SSS-75-R-2604, DNA-3932T
Contract DNA001-74-C-0043

Descriptors: *Electromagnetic pulses, *Computerized simulation, *Electron transport, *Electric current, Artificial satellites, Plasma medium, Temperature, Space charge, Photoelectrons.
Identifiers: System generated electromagnetic pulses, Internal electromagnetic pulses, Surface currents, Plasma frequency, Debye length.

Particle simulation techniques for SGEMP are discussed. A variety of techniques for treating these problems is presented and examples are used to illustrate the advantages of each method. (Author)

AD-A029 282/1GA PC$3.50/MF$3.00
Massachusetts Inst of Tech Lexington Lincoln Lab
Spectra of Ionospheric Scintillation.
Journal article,
Robert K. Crane. 12 Aug 75, 11p JA-4482, ESD-TR-76-191
Contract F19628-73-C-0002
Availability: Pub. in Jnl. of Geophysical Research v81 n13 p2041-2050, 1 May 76.

Descriptors: *Ionospheric propagation, Scintillation, Amplitude modulation, Phase modulation, Electron density, Very high frequency, Ultrahigh frequency, Reprints.
Identifiers: *Ionospheric scintillations.

Observations of amplitude and phase scintillation were made at the Millstone Hill radar facility by using phase coherent sources at 150 and 400 MHz on the U.S. Navy navigation system satellites. These observations have been processed to yield power spectra of the fluctuations in the logarithm of the received power (log power) at each frequency and the fluctuations in phase path length difference (differential phase) between the two frequencies. A theoretical analysis was performed to predict the log power and differential phase power spectra. The theoretical model was based upon weak scatter theory for a thick screen with a three-dimensional power law power spectrum representation for the electron density fluctuations. A -4 exponent for the power law best fit the observed spectra. For weak scintillation (rms fluctuations in log power less than 5 dB or S4 less than 0.9) the theoretical calculations were in excellent agreement with the observations. For strong scintillation, saturation was observed, and the measured spectra were broader than those predicted on the basis of weak scatter theory. An increase in electron density fluctuations relative to the value predicted by the power law model was observed at scale sizes smaller than 0.8 km. This increase may be responsible for the anomalous scintillation observations at gigahertz frequencies. (Author)

AD-A029 516/2GA PC$5.00/MF$3.00
Dikewood Industries Inc Albuquerque N Mex
Penetration of Electromagnetic Pulses through Larger Apertures in Shielded Enclosures.
Final rept.,
R. Mittra, and L. Wilson Pearson. May 76, 79p AFWL-TR-75-95
Contract F29601-74-C-0010
Prepared by Illinois Univ. at Urbana-Champaign.

Descriptors: *Electromagnetic scattering, *Coupling(Interaction), Integral equations, Linear algebraic equations, Matrices(Mathematics), Algorithms, Computer programs, Computations, Apertures, FORTRAN, Transient radiation effects, Method of moments, Sparse matrix.
Identifiers: IBM-360/370 computers, Singularity expansion method.

The results of an initial investigation of the Singularity Expansion Method representation of the electromagnetic coupling through a rectangular aperture in a perfectly conducting sheet are reported. The problem is formulated in terms of the coupled Hallen-type integral equations for the dual problem of a rectangular plate. The integral equations are converted to a system of linear algebraic equations by way of the method of moments with subsectionally constant expansion functions and collocation testing. Several techniques used in minimizing the execution time of the computations are described. Some difficulties in accurately approximating the singularities of the system of integral equations by the singularities of the algebraic system are discussed. These difficulties arise because the subsectionally constant representation for the current cannot adequately represent the correct edge singularities in the currents on the plate. A set of pole trajectories indicative of the trends in pole location for the plate is reported. A listing of the pertinent computer code is provided.

PB-257 342/6GA PC$12.50/MF$3.00
National Bureau of Standards, Boulder, Colo. Central Radio Propagation Lab.
Ionospheric Radio Propagation,
Kenneth Davies. Nov 65, 480p NBS-Mono-80, NOAA-76091705
Revision of report dated 1 Apr 65.

Descriptors: *Ionospheric propagation, Ionospheric disturbances, Radio transmission, Ionosphere, Radiofrequency interference, Wave propagation, Scatter propagation, Low frequencies, Very low frequencies.

The book replaces in part a previous publication of the National Bureau of Standards (Circular 462). Since the publication of the earlier work in 1948, the whole subject has undergone a considerable transformation due to special geophysical effort and the advent of the Space Age. The scope of the present work has been broadened to include aspects of ionospheric radio propagation which were not treated in the earlier publication. Such topics as electron-layer production, the geomagnetic field, magneto-ionic theory, and oblique propagation have been expanded. While the book is devoted mostly to the propagation of high-frequency radio waves, two chapters have been included in order to give the reader a better perspective of the relationship of the high-frequency band to the lower frequency (LF and VLF) bands and upper (VHF) frequency band. This book is of use both to research workers and to communications engineers who already have some background knowledge of radio propagation via the ionosphere.

21. PROPULSION AND FUELS

21D. Fuels

AD-A029 382/9GA PC$4.00/MF$3.00
Naval Research Lab Washington D C
Pro-static Agents in Jet Fuels.
Final phase rept.,
J. T. Leonard, and H. F. Bogardus. 16 Aug 76, 39p Rept no. NRL-8021
Sponsored in part by American Petroleum Inst., Washington, D.C.

Descriptors: *Static electricity, *Fuel additives, *Electrical conductivity, Jet engine fuels, Heptane, Tables(Data), Fire resistant materials, Experimental design.
Identifiers: *Jet A fuel, ASTM D 3114.

The effects of a wide variety of polar compounds and fuel additives on both the electrical conductivity and electrostatic charging tendency of both silica gel treated n-heptane and Jet A fuels have been examined. Conductivity was determined by ASTM D3114 and charging tendency by measuring the current developed as the hydrocarbon liquid passed through an electrically isolated filter holder containing a paper, fiberglass or teflon screen filter. Of all the compounds and additives tested, water came closest to fulfilling the definition of an ideal pro-static agent, viz, a compound that greatly increases the charging tendency of a fuel without increasing its conductivity. After saturation with water, the charge density of clay-treated Jet A fuel increased by a factor of 23 and that of an untreated Jet A by a factor of 7. The conductivities of both fuels remained essentially the same. Since water did not increase the charging tendency or conductivity of silica gel-treated n-heptane it was concluded that it is not water per se, but rather its interaction with some constituent in the jet fuel that is responsible for its pro-static effect.

AD-A029 493/4GA PC$5.50/MF$3.00
Bonner and Moore Associates Inc Houston Tex
Impact of Fuel Properties on Jet Fuel Availability.
Final technical rept. Apr 75-Apr 76,
Joseph C. Dickson, and Louis P. Karvelas. Apr 76, 108p AFAPL-TR-76-7
Contract F33615-75-C-2022

Descriptors: *Jet engine fuels, Boiling point, Physicochemical properties, Specifications, Surveys, Supplies, Refining, Crude oil, Costs.
Identifiers: Colligative properties.

A study was conducted to analyze the effects that relaxing certain jet fuel specification requirements would have on jet fuel availability from domestic and foreign sources. The primary objective of the study was to determine the most critical specification requirements where relaxation could be expected to have an impact on availability, and to estimate the effects that

changes in these critical specifications would have on the refining industry's willingness to offer jet fuel for sale. The principal tool used in this study was a confidential survey of the U.S. Refining Industry. Results based on the adjusted survey data indicate that, for domestically produced kerosene-type jet fuels, increases of 20% could be realized by relaxing Freeze Point and Final Boiling Point; and increases of about 28% could be realized by relaxing Aromatics, Smoke Point, Freeze Point, and Final Boiling Point (FBP). For naphtha-type jet fuels, an increase of 24% for relaxing Freeze Point alone is indicated.

NTISUB/B/127-76/006
PC$4.00/MF$3.00
Federal Energy Administration, Washington, D.C. Office of Policy and Analysis.
Monthly Energy Review, August 1976.
Aug 76, 87p FEA/B-76/353
See also NTISUB/B/127-76/007.
Paper copy also available on subscription, North American Continent price $36.00/year; all others write for quote.

Descriptors: *Petroleum products, *Crude oil, *Commerce, Gasoline, Fuel oil, Heating fuels, Distillates, Residual oils, Prices, International trade, Cost indexes, Production, Demand(Economics), Supply(Economics), Stockpiles, Reserves, Graphs(Charts), Statistical data, Nuclear power, Electric utilities, Energy consumption, Fuel consumption, Exploration, Jet engine fuels, Natural gas liquids, Coal, Natural gas, Fossil fuels.

Contains tables, graphs, and data dealing with production, consumption, and prices of crude oil, natural gas, coal, and petroleum products.

PB-256 007/6GA PC$6.00/MF$3.00
Mitre Corp., McLean, Va.
Survey of Alcohol Fuel Technology. Volume I.
Technical rept.,
Bernard Baratz, Robert Ouellette, Wayne Park, and Betsy Stokes. Nov 75, 143p* M74-61-Vol-1
Contract NSF-C925
See also Volume 2, PB-256 008.

Descriptors: *Alcohols, Production, Air pollution, Automotive fuels, Gasoline, Methyl alcohol, Environmental impacts, Ethyl alcohol, Propanols, Butanols, Exhaust emissions, Economics, Synthesis(Chemistry), Electric power generation, Storage, Transportation, Research, Chemical properties, Utilization, Exhaust emissions, Coal gasification, Blending, Regulations.
Identifiers: *Fuel substitutes, Fuel storage.

This report summarizes a study on alcohol fuel technology sponsored by the National Science Foundation during the months of June through December 1974. The goals of this study have been to collect a base of information on alcohols as fuel, to synthesize current research on the subject, and to make an effort to tabulate current and ongoing research. The report also lists current researchers, their research topics, and their locations.

PB-256 008/4GA PC$4.50/MF$3.00
Mitre Corp., McLean, Va.
Survey of Alcohol Fuel Technology. Volume II.
Technical rept.,
Betsy Stokes, and Wayne Park. Nov 75, 68p*
M74-61-Vol-2
Contract NSF-C925
See also Volume 1, PB-256 007.

Descriptors: *Bibliographies, *Alcohols, *Fuels, Automotive fuels, Fuel cells, Coal gasification, Wastes, Enzymes.
Identifiers: *Fuel substitutes, Waste utilization.

Research was conducted on alcohol fuel technology. The goals of this study have been to collect a base of information on alcohols as fuel, to synthesize current research on the subject, and to make an effort to tabulate current and ongoing research. This volume is a bibliography covering all aspects of alcohol fuel technology.

PB-256 445/8GA PC$4.50/MF$3.00
Thayer School of Engineering, Hanover, N.H. Dartmouth System Dynamics Group.
The Transition to Coal.
Annual rept. no. 2, 1973-74,
Roger F. Naill, John Stanley Miller, and Dennis L. Meadows. 1 Nov 74, 51p DSD-18, NSF/RA/N-74/289
Grant NSF-SIA72-03454

Descriptors: *Energy policy, *Coal utilization, *Fuel management, *Energy management, Energy supplies, Energy demand, Fossil fuels, Production, Supply(Economics), Demand(Economics), Energy models, Constraints, Forecasting, Planning, Computerized simulation.
Identifiers: National planning and development, COAL 1 model.

The basic energy problem facing the U.S. and other industrialized nations is not to secure independence from foreign energy suppliers, but instead to negotiate an orderly transition from primary reliance on fossil oil and gas resources to predominant use of energy sources not tied to finite fuel reserves. This report describes the major energy problem currently facing the United States, and proposes a long-term energy strategy based on increased U.S. coal production. Major environmental, capital, and labor constraints affecting coal demand and production are discussed. A model, that is a tool for designing and testing broad coal-related energy programs is described.

PB-256 680/0GA PC$5.50/MF$3.00
NUS Corp., Rockville, Md.
Availability of Potential Coal Supply Through 1985 by Quality Characteristics,
Landy A. Stinnett, George W. Toth, Shirley C. Barber, Jeffrey B. Goodman, and Jasper Maltese. Aug 76, 121p* NUS-1725, FEA/G-76/367
Contract FEA-CO-05-60574-00

Descriptors: *Coal reserves, *Energy reserves, *Energy supplies, Fossil fuel reserves, Anthracite, Lignite, Subbituminous coal, Availability, Production, Quality, Prices, Economic analysis, Forecasting.
Identifiers: *Low sulfur coal.

The objective of this study is to determine the availability of uncommitted low-sulfur coal in terms of quantity, quality, and timeliness of production and uncommitted recoverable coal which is potentially available for production. The effects on coal availability of manpower, equipment, availability, economics, ownership, and regulations are considered implicitly by virtue of the responses received in the market survey.

21E. Jet and Gas Turbine Engines

AD-A029 340/7GA PC$5.00/MF$3.00
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
Transient Simulation of a Two-Stage Fan with Large Inter-Stage Volumes.
Interim rept. Jul 75-May 76,
Stephen J. Przybylko. Jul 76, 92p Rept no. AFAPL-TR-76-51

Descriptors: *Axial flow fans, Computerized simulation, Staging, Fans, *Turbojet engines, *Turbofan engines, Volume, Transients, Computer programs, Subroutines, Variable cycle engines.

This report describes a computer simulation of a two stage fan with larger than normal volumes between the two stages. The program uses the Newton-Raphson iteration method to solve the simultaneous iteration loops. The fan is modeled in a stage by stage manner. The large volumes are shown to affect the dynamic behavior of the fan. (Author)

AD-A029 352/2GA PC$4.00/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Variable-Area Subsonic Diffuser Study.
Final rept. 1 Jul 75-30 Jun 76,
Delbert Taylor, and David A. Duesterhaus. Sep 76, 36p Rept no. AEDC-TR-76-126
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-ETF-TR-76-75.

Descriptors: *Subsonic diffusers, *Variable area nozzles, *Plug nozzles, *Turbofan engines, *Exhaust diffusers, *Turbojet exhaust nozzles, Exhaust gases, Pressure, Performance(Engineering), Configurations, Airplane engine cowlings, Combustion, Test equipment, Static pressure, Test and evaluation, Model tests.
Identifiers: *TF-39 Engines.

An experimental development program was conducted to investigate the performance of a variable-area subsonic diffuser. The project goal was to improve the static pressure rise ratio of exhaust gas diffusers used with subsonic, high-bypass-ratio, front fan engines during direct-connect testing in ground test facilities. A one-tenth scale model of the TF-39 turbofan engine was used in the experiment. Diffuser performance data were recorded during model engine operation with cold air at five simulated power settings with five diffuser configurations. Test cell and engine cowl surface pressures were recorded to determine the influence of the exhaust gas diffuser on these pressures. Data from all configurations were analyzed to determine the effect of the exhaust gas diffusers on test cell and engine cowl pressures and to determine the diffuser pressure rise ratio. Test cell and engine surface pressure data were not affected by the diffuser configuration. The static pressure rise ratio of one variable-area diffuser configuration tested exceeded that of all others and a conventional 5-deg half-angle subsonic diffuser. (Author)

AD-A029 371/2GA PC$7.50/MF$3.00
Colt Industries Inc West Hartford Conn Chandler Evans Control Systems Div
Engine Evaluation of Advanced Technology Control Components.
Final rept. 7 Mar 74-1 Feb 76,
T. Morrison, and A. H. White. Aug 76, 179p
USAAMRDL-TR-76-17
Contract DAAJ02-74-C-0020

Descriptors: *Helicopter engines, *Gas turbines, *Control systems, Computers, Electronic equipment, Modular construction, Engine fuel systems components, Engine air systems components, Inlet guide vanes, Actuators, Performance(Engineering), Detectors, Temperature.
Identifiers: Small turbine advanced gas generator.

This report describes the results of a design, fabrication, bench test, and evaluation of an engine-mounted advanced technology gas turbine engine control system on which development was started under previous Army contracts. The control system comprises a full-authority electronic computer module, a fuel metering and inlet guide vane actuator module, a high-speed fuel pump and alternator module, a radiation pyrometer for blade temperature

limiting, and other required sensors. The control modules are evaluated on an experimental Army gas turbine engine (STAGG) which was under development at Pratt and Whitney Florida Research and Development Corporation. Tests of the engine-mounted system were conducted in two phases. An environmental phase allowed the control components to be debugged and evaluated over the full power range of the engine while the engine was being controlled by a test stand control system. The second phase of testing demonstrated active control of the engine. All of the engine-mounted control testing was conducted in accordance with the planned engine test schedule on a noninterference basis. Approximately 44 hours of engine-mounted testing were accumulated, and about 8.6 of these hours included active engine control. During this testing, all of the control modules were successfully evaluated including the control of engine accelerations, decelerations, speed governing, inlet guide vane scheduling and ignition.

AD-A029 485/0GA PC$5.00/MF$3.00
Center for Naval Analyses Arlington Va Inst of Naval Studies
Aircraft Engine Maintenance Study,
James R. Capra, Barbara C. Clemmensen, William Lavalee, and John R. Schiffer. Sep 75, 84p Rept no. CNS-1060
Contract N00014-76-C-0001

Descriptors: *Aircraft maintenance, *Aircraft engines, *Repair, Aviation safety, Reliability, Maintenance, Maintainability, Efficiency, Costs, Cost effectiveness, Cost estimates, Models, Statistical analysis, Turbojet engines, Turbofan engines, Turboprop engines.
Identifiers: Overhauls, Maximum operating times.

This study reviews three problem areas of aircraft engine maintenance in the Navy: the setting of maximum operating time, the performance of overhauls for cause instead of repairs, and the site of engine repair. All of the problem areas affect in some way the number of engine overhauls performed annually. The study assesses the effectiveness of engine overhaul from a safety and reliability standpoint by analyzing Navy data on engine-related aircraft mishaps and engine removals. The analysis revealed that within the current range of operations engines wear in but under current policies of continued repair/replacement and relatively short times between overhauls, engines as a system do not wear out. Consequently, policies which would decrease the number of overhauls performed annually and increase the time between overhauls appear to be reasonable from a reliability and safety standpoint. Using a model of the engine repair and overhaul pipeline, the study finds that three new policies, two of which would increase the time between overhauls, result in lower annual maintenance costs and improved spare engine availability. (Author)

PAT-APPL-677 944/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
A Digital Flow Control System.
Patent Application,
Robert E. Cram, Walter Gill, and James A. Loundagin. Filed 26 Apr 76, 11p AD-D002 873/8
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Ramjet engines, *Test stands, *Fuel meters, Fluid control, Valves, Venturi tubes, Flow rate, Digital systems.
Identifiers: *Patent applications, *Cavitating venturis, PAT-CL-137-14.

The patent application relates to a digital flow control system for testing ramjet engines that permits control of fuel in steps, or percentages, of full flow rate. Four cavitating venturis connected to four valves control the flow rate through the valves such that the fuel flow rate is regulated in 10% increments of full flow rate depending upon the combination of valves which are open.

21H. Rocket Motors and Engines

AD-A029 569/1GA PC$5.50/MF$3.00
Arnold Engineering Development Center Arnold Air Force Station Tenn
Studies of the Exhaust Products from Solid Propellant Rocket Motors.
Final rept. 1 Jul 73-30 Jun 75,
R. Dawbarn, and M. Kinslow. Sep 76, 116p Rept no. AEDC-TR-76-49
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn,. Rept. no. ARO-VKF-TR-75-112.

Descriptors: *Exhaust gases, *Combustion products, *Solid propellant rocket engines, Hydrogen chloride, Alumina, Water vapor, Environmental tests, Particles, Condensation nuclei, Space shuttles, Contamination, Hydrochloric acid, Test facilities, Instrumentation.

This study was undertaken to determine the feasibility of conducting environmental chamber tests on the physical processes which occur when a solid rocket motor exhaust mixes with the ambient atmosphere. Of particular interest was the interaction between hydrogen chloride, aluminum oxide, and water vapor. The program consisted of three phases: (1) building a small rocket motor and using it to provide the exhaust species in a controlled environment; (2) evaluating instruments used to detect and measure HCl concentrations and if possible determining whether the HCl existed in the gaseous state or as an acid aerosol; (3) monitoring a series of 6.4-percent scale space shuttle motor tests and comparing the results to the environmental chamber studies. Eighteen firings were conducted in an environmental chamber with the initial ambient relative humidity set at values from 29 to 100 percent. Two additional firings were made in a large shed, and four were made on an open concrete apron. Six test firings at MSFC were monitored, and the ground level concentrations are reported. Evidence is presented which shows that the larger Al2O3 (5 to 50 micrometers) particles from the rocket motor can act as condensation nuclei. Under appropriate ambient conditions where there is sufficient water vapor this results in the formation of an acid aerosol. Droplets of this acid were detected both in the environmental chamber and in the scaled shuttle engine tests.

21I. Rocket Propellants

PAT-APPL-683 996/GA PC$3.50/MF$3.00
Department of the Navy Washington D C
Mechanical-Chemical Linkage Between Polymer Layers.
Patent Application,
Bernard Wasserman, and Martin H. Kaufman. Filed 6 May 76, 10p AD-D002 874/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Solid rocket propellants, *Silicon compounds, *Elastomers, Curing, Polymers, Chemical bonds, Crosslinking(Chemistry).
Identifiers: *Patent applications, PAT-CL-60-39.47.

The patent application pertains to an elastomeric or rigid polymeric materials, suchs as a propellant, is strongly bonded to an incompatible material, such as a silicon rubber liner, when a long chain polymer which is insoluble in and unreactive with the liner but has groups reactive with the propellant is added to the liquid or uncured liner. As the liner cures, the polymer chain migrates to the surface. Upon laying the propellant on the surface and curing the propellant, the propellant is crosslinked to the long chain polymer, which is entangled in the rubber liner.

22. SPACE TECHNOLOGY

22B. Spacecraft

AD-A029 440/5GA PC$5.00/MF$3.00
Boston Coll Chestnut Hill Mass Space Data Analysis Lab
Data Processing System Developed for an Air Force Satellite.
Final rept. 1 Feb 73-31 Jan 76,
Dennis E. Delorey. 29 Feb 76, 98p BC-SDAL-76-30, AFGL-TR-76-0121
Contract 0F19628-73-C-01370

Descriptors: *Scientific satellites, *Data processing equipment, Air Force research, Accelerometers, Ion density, Atmospheric physics, Tables(Data).

A data processing system was developed for the reduction and analysis of transmitted signals from an Air Force satellite. Flow of data through the system is described and program interfaces are defined. Experiments flown aboard the spacecraft are briefly described and the processing routines used to construct data bases are elaborated. File formats for data bases created at all phases of the processing system are defined.

22D. Spacecraft Launch Vehicles and Ground Support

PATENT-3 963 196 Not available NTIS
Department of the Air Force Washington D C
Aircraft/Spacecraft Ground Accelerator.
Patent,
William H. Walker. Filed 12 Jun 74, patented 15 Jun 76, 4p AD-D002 846/4, PAT-APPL-478 551
Supersedes AD-164 857.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Aircraft, *Spacecraft, *Surface launching, *Patents, Launchers, Acceleration, Hydraulic equipment, Deceleration, Fairings.
Identifiers: PAT-CL-244-50.

The patent relates to an accelerator including a framework having an aerodynamic fairing shaped to provide positive pitch and directional stability and including a support and attachment system for holding a fully fueled horizontal takeoff space vehicle such that the negative structure loadings are reduced to a minimum. The running gear system includes a plurality of wheel tire sets with braking and decelerating systems associated therewith.

SUBJECT INDEX

ABATEMENT
The Importance of Local Initiative in Environmental Management.
PB-256 942/4GI 13B

ABBREVIATIONS
Federal Information Processing Standards Register: States and Outlying Areas of the United States. Federal General Data Standard Representations and Codes.
FIPS-PUB-5-1 9B

Federal Information Processing Standards Register: Counties and County Equivalents of the States of the United States. Federal General Data Standard Representations and Codes.
FIPS-PUB-6-2 9B

ABLATION
Studies of Transitional Flow, Unsteady Separation Phenomena and Particle Induced Augmentation Heating on Ablated Nose Tips.
AD-A029 545/1GI 16C

ABSTRACTS
The Shock and Vibration Digest. Volume 8, Number 8, August 1976.
AD-A029 220/1GI 20K

ACCESS PROCEDURES
Assisting Network Users with a Network Access Machine.
PB-256 890/5GI 9B

ACCIDENT INVESTIGATIONS
Field Investigation of Natural Gas Pipeline Accident, Canterbury Woods, Annandale, Virginia.
PB-257 007/5GI 13L

ACCIDENTS
Feasibility Study of Mathematical Simulation of Loading Related Recreational Boat Accidents.
AD-A029 139/3GI 13L

ACETOPHENONE/BROMO
Separation of Long and Short Chain Fatty Acids as Naphthacyl and Substituted Phenacyl Esters by High Performance Liquid Chromatography.
AD-A029 263/1GI 14B

ACETOPHENONE/CHLORO
Separation of Long and Short Chain Fatty Acids as Naphthacyl and Substituted Phenacyl Esters by High Performance Liquid Chromatography.
AD-A029 263/1GI 14B

ACETOPHENONE/NAPHTHYL
Separation of Long and Short Chain Fatty Acids as Naphthacyl and Substituted Phenacyl Esters by High Performance Liquid Chromatography.
AD-A029 263/1GI 14B

ACETOPHENONE/NITRO
Separation of Long and Short Chain Fatty Acids as Naphthacyl and Substituted Phenacyl Esters by High Performance Liquid Chromatography.
AD-A029 263/1GI 14B

ACHIEVEMENT TESTS
Reprint: The ICET Testing Program for the Certification of Engineering Technicians.
PB-256 864/0GI 5I

ACOUSTIC ARRAYS
Decoupled Hydrophone with Reduced Response to Vibration and Stress Concentration.
PATENT-3 961 304 17A

ACOUSTIC COUNTERMEASURES
Encoded Echo-Ranging Signal Generator.
PATENT-3 958 214 17B

ACOUSTIC DETECTION
Reprint: Analysis of Threshold-Induced Bias Inherent in Acoustic Scattering Cross-Section Estimates of Individual Fish.
PB-256 986/1GI 6C

ACOUSTIC EMISSIONS
Harmonic Radiations in the Field of a Baffled Piston.
AD-A029 576/6GI 20A

ACOUSTIC EQUIPMENT
Acoustic Ridge Waveguide Technology.
AD-A029 510/5GI 9A

ACOUSTIC FIELDS
Nonlinear Propagation Distortion of Jet Noise.
AD-A029 575/8GI 20A

ACOUSTIC MEASUREMENT
USAF Bioenvironmental Noise Data Handbook. Volume 12. MJ-3 Test Stand, Aircraft Hydraulic System.
AD-A029 586/5GI 20A

USAF Bioenvironmental Noise Data Handbook. Volume 17. MC-1 Compressor, Reciprocating, Power Driven.
AD-A029 591/5GI 20A

Apparatus and Method for Mapping Acoustic Fields.
PATENT-3 961 291 14B

ACOUSTIC RIDGE WAVEGUIDES
Acoustic Ridge Waveguide Technology.
AD-A029 510/5GI 9A

ACOUSTOELECTRIC CONVOLVERS
Reprint: Acoustoelectric Convolvers for Programmable Matched Filtering in Spread-Spectrum Systems.
AD-A029 288/8GI 17B

ACQUISITION
Project Management by Functional Codes of a Navy Systems Command (NAVELEXSYSCOM).
AD-A029 333/2GI 5A

ACTIVATED SLUDGE PROCESS
Operating Experience and Design Criteria for UNOX Wastewater Treatment Systems. Prepared for Environmental Protection Agency Technology Transfer Program Design Seminar for Wastewater Treatment Facilities, February 29-March 1, 1972, New York.
PB-256 386/4GI 13B

ADDING CIRCUITS
An Electro Optic Binary Adder.
PAT-APPL-700 683/GI 9B

High-Speed Adder.
PATENT-3 970 833 9B

ADHESIVE BONDING
A Chromate-Free Process for Preparing Aluminum Substrates for Adhesive Bonding — A Preliminary Study.
AD-A029 196/3GI 11F

Component Parts Assembly with Joints, Adhesive-Mechanical. Part 4. Analysis and Test of Bonded and Weldbonded LAP Joints.
AD-A029 426/4GI 13E

ADJUSTMENT (PSYCHOLOGY)
Indicators of the Responsiveness of Employment Systems to Workers' Needs and Values.
PB-256 871/5GI 5J

ADSORPTION
Theory of Helium Adsorption on Simple and Noble Metal Surfaces.
AD-A029 233/4GI 7D

AERATION
Design and Operation of Aerated Lagoons for Municipal Wastewater Treatment in Cold Climates.
PB-256 500/0GI 13B

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PB-256 477/1GI 15E

AT(04-3)-954
Shannon and Wilson, Inc. Agbabian Associates, Seattle, Wash.
PB-257 154/5GI 8M
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AT(49-13)-3003
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PB-256 917/6GI 7D

AT(49-24)-0250
Arizona Univ., Tucson. Dept. of Nuclear Engineering.
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Franklin Inst. Research Labs., Philadelphia, Pa.
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Wisconsin Univ., Madison. Water Resources Center.
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Kentucky Water Resources Research Inst., Lexington.
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DI-14-31-0001-5033
North Carolina Water Resources Research Inst., Raleigh.
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DI-14-31-0001-5045
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PB-256 579/4GI 13B
Wisconsin Univ., Madison. Water Resources Center.
PB-256 694/1GI 13B

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Iowa State Water Resources Research Inst., Ames.
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DI-14-34-0001-6010
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Kentucky Water Resources Research Inst., Lexington.
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DI-14-34-0001-6050
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PB-256 803/8GI 5I

DL-B-9-M-5-0823
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DL-B-9-M-5-1808
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E(40-1)-4922
Virginia Univ., Charlottesville. School of Engineering and Applied Science.
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